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The Reductio ad absurdum argument prior to Aristotle

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THE *REDUCTIO AD ABSURDUM* ARGUMENT PRIOR TO ARISTOTLE

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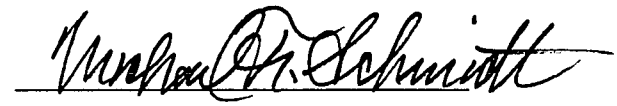

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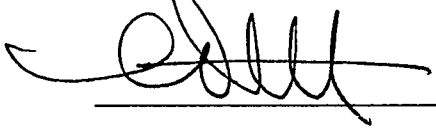

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ABSTRACT

THE *REDUCTIO AD ABSURDUM* ARGUMENT PRIOR TO ARISTOTLE

by Robert W. Daigle

Two passages from Aristotle's Sophistical Refutations have been construed by modern historians of logic to imply that Aristotle's work in logic had begun from nothing, *i.e.*, he had started to investigate logic with no prior influences, and without consulting any previous works on logic. By doubling as an historical and interpretive account of the *reductio ad absurdum* argument prior to Aristotle, this thesis argues against the tradition of maintaining that there were neither influential sources, nor any previous inquiries, to Aristotle's works on logic.

A grammatical analysis of one of these two passages from the Sophistical Refutations shows the ambiguities in the passage, and also reveals what Aristotle thought about previous inquiries in logic. Then, examples of *reductio ad absurdum* reasoning from Xenophanes of Colophon and Parmenides of Elea are examined from philological and philosophical standpoints. These examples represent inquiries into logic made by these Pre-Socratic thinkers prior to Aristotle.

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INTRODUCTION

Section 1: A Grammatical Critique of Aristotle.

> Ταύτης δὲ τῆς πραγματείας οὐ τὸ μὲν ἦν τὸ δ' οὐκ ἦν προεξειργασμένον, ἀλλ' οὐδεν παντελῶς ὑπῆρχεν.[1]
>
> But of this inquiry, there was not one, and there had not been one previously worked out before, but not one completely began.

With this passage from Aristotle's Sophistical Refutations, an inquiry into the pre-history of the Aristotelian analytic system can begin. This passage has been cited by modern historians of logic to justify the originality of Aristotle's contributions to logic.[2] The consensus among these historians is that Aristotle was the first systematizer of logic, or the first to analyze the methodology of certain types of reasoning, and then to arrange these logics into his own unique method. Aristotle is therefore claimed by these historians of logic (as he is generally accepted in the discipline of Philosophy) as the *Father Of Logic* .

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[1] *Aristotelis, Topica Et Sophistici Elenchi* , ed. W.D. Ross, (Oxford: Oxford University Press, 1958), 250, 183^{b}34-36.

[2] Along with another passage in the Sophistical Refutations (184^{b}1-3) also used for this purpose (which will be discussed later), this passage is used to justify the originality of Aristotle's contributions in Carl Prantl's Geschichte der Logik im Abendlande Vol.1 (Leipzig: S. Hirtzl, 1855; reprint Graz: Akademische Druck - U. Verlagsanstalt, 1955), 7; Robert Adamson A Short History Of Logic (Edinburgh & London: William Blackwood and Sons, 1911), 22; Federigo Enriques, The Historic Development of Logic, trans. by Jerome Rosenthal, (New York: Henry Holt and Co., 1929), 4; I.M. Bochenski, A History of Formal Logic, trans. Ivo Thomas, (South Bend, Indiana: University of Notre Dame Press, 1961), 29; and William and Martha Kneale, The Development of Logic (Oxford: Clarendon Press, 1962), 43.

However, this important passage cited above contains some ambiguities concerning the development of logic prior to and including Aristotle. These ambiguities arise primarily in connection with the following grammatical analysis of this important passage from the Sophistical Refutations. The analysis of the grammatical construction of the passage intends to call into question the originality of the Aristotelian logical system, and to introduce the relevance of investigating the received development of logic prior to Aristotle. The scope of the investigation will be to focus upon at least one important yet neglected tradition in the history of logic prior to Aristotle, *viz.*, the tradition of the *reductio ad absurdum* , and to recognize its importance not only in the history of logic but also in Aristotle's contributions to the development of logic.

In a standard modern translation of the Sophistical Refutations, the passage has been translated in this way:

> Of the present inquiry, on the other hand, it was not the case, that part of the work had been thoroughly done before, while part had not. Nothing existed at all. [3]

In another modern translation, the passage reads:

> Of our present inquiry, however, it is not true to say that it had already been partly elaborated and partly not; nay, it did not exist at all.[4]

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[3] Aristotle, Sophistical Refutations, trans. W.A. Pickard-Cambridge (1928), in The Complete Works of Aristotle, Vol. 1, ed. Jonathan Barnes (Princeton, N.J.: Princeton University Press, 1984), 314.

[4] Aristotle, Sophistical Refutations, trans. E.S. Forster (1955), in Aristotle: On Sophistical Refutations, On Coming-To-Be And Passing-Away, On The Cosmos "Loeb Classical Library," (Cambridge, Mass.: Harvard University Press, 1955), 154-155.

The overall issue to be addressed by this thesis concerns the final phrase in the passage, translated by Pickard-Cambridge as "nothing existed at all," and by Forster as "nay, it did not exist at all." These two translations imply that Aristotle's work in logic had begun *from nothing, i.e.*, he had started his investigations on logic with no prior influences, and without consulting any previous works on logic. This thesis will argue against the implication that Aristotle began his studies on logic *ex nihilo* : first, by investigating the ambiguities in the above passage.

The first appearance of ambiguity in the passage is with the initial phrase, ταύτης δὲ τῆς πραγματείας, translated by Pickard-Cambridge and Forster, as 'of the present inquiry,' or 'of our present inquiry.' The clause can be roughly translated to say 'and' or 'but of this business,' or 'and' or 'but of this affair.' A quick reading of the passage suggests that it is intended to refer to the objective of Aristotle's present πραγματείας, or 'study:' which appears to be the combined work of the Topics and the Sophistical Refutations.[5] However, this reference to Aristotle's objective in the Topics and the Sophistical Refutations based on this phrase has been viewed as ambiguous since the 2nd Century A.D. In his commentary on the Sophistical Refutations, Alexander of Aphrodisias wrote that the word πραγματείας in the initial phrase "may either mean the topic or all logic."[6] In short, there is a tradition of ambiguity pertaining to the reference of the Greek word πραγματείας in the initial phrase, such that it may refer to Aristotle's objective in the Topics and the Sophistical Refutations, but according to Alexander of Aphrodisias, it may also refer to πᾶσαν τὴν λογικήν, to 'all logic.'

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[5] This passage is found at the end of the Sophistical Refutations, and it is important to note that this work is traditionally viewed as an appendix to the Topics.

[6] Alexander, *Sophisticos Elenchos Commentarium*, in *Commentaria In Aristotelem Graeca*, ed. M. Wallies, Vol.II (Berlin: George Reimer, 1848), 197. "Πραγματείαν λέγοι ἄν ἢ τὴν τοπικὴν ἢ πᾶσαν τὴν λογικήν."

What is Alexander implying by πᾶσαν τὴν λογικήν? To be sure, if πραγματείας meant 'all logic,' it would broaden Aristotle's claim in the passage from the Sophistical Refutations: to include all of his own works on logic to the Sophistical Refutations. But significantly, πραγματείας would also be broadened to include the state of logic prior to Aristotle. Though only the ambiguity of πραγματείας is intended to be emphasized here, these conjectures about the meaning of Alexander's interpretation of πραγματείας as ambiguous contribute in an important way to this present study of the received history of the development of logic prior to Aristotle. These conjectures allude to a history of logic prior to Aristotle, albeit a history made somewhat insignificant by the importance of Aristotle's contributions.

The other parts of the passage in the Sophistical Refutations, which may not have the tradition of ambiguity as the initial phrase, can also be shown to possess some ambiguity. After translating the initial phrase ταύτης δὲ τῆς πραγματείας, as 'and' or 'but of this business,' or 'and' or 'but of this affair;' and appearing in the above modern translations as 'of the present inquiry,' and, 'of our present inquiry,' the next part of the passage, οὐ τὸ μὲν ἦν τὸ δ' οὐκ ἦν προεξεργασμένον, refers back to the initial clause as 'something which was not, nor had not been completely worked out before,' or, 'something that was not, and had not been accomplished before,' or 'something that was not, nor had not been achieved before.' Pickard-Cambridge, in the standard translation, read this section of the passage as "on the other hand, it was not the case that part of the work had been thoroughly done before, while part had not."[7] E. S. Forster, meanwhile, translated this part as "however, it is not true to say that it had already been partly elaborated and partly not."[8] The participle in this

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[7] Aristotle, Sophistical Refutations, trans. W.A. Pickard-Cambridge.

[8] Aristotle, Sophistical Refutations, trans. E.S. Forster.

section of the passage, προεξειργασμένον, derives from the Greek deponent verb προεξεργάζομαι, which means "work out before," and it is noted that the participle comes from a deponent verb which has a "perfect passive tense in a passive sense."[9] This means that προεξειργασμένον, as a perfect participle, has an idiomatic passive sense, and so signifies a passive condition (of something that 'had been worked out before'); thus, it indicates work (πραγματείας) on logic that had already been carried out in time. Adding the two negative particles, οὐ and οὐκ, to each of the two imperfect active indicative, third person singular verbs, ἦν, roughly translates as 'one was not.' Thus, before the meaning of the participle is added, this passage (οὐ τὸ μὲν ἦν τὸ δ' οὐκ ἦν) roughly translates as 'one was not, and one was not.' Aristotle appears to be making a reference to the recent present (with regard to prior works on logic), such that 'there was not one' prior logic with which to study from or to comment upon. When the participle is added, however, it makes the section read: 'one was not, and one had not been worked out before,' or, 'one was not, and one had not been previously accomplished,' or, 'one was not, and one had not been previously achieved.'[10] So thus far, by roughly saying , that 'of this current πραγματείας, there was none, nor had one been worked out before,' or 'had been previously accomplished,' or 'had been previously achieved,' it appears Aristotle is commenting on his present time, and on a past time. In short, Aristotle is saying thus far, that there were no prior

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[9] Henry Liddell, and Robert Scott, A Greek-English Lexicon, 9th Ed. rev. by Henry Stuart Jones,, (Oxford: Oxford University Press, 1940), 1478. All subsequent references will be cited as LSJ. The Greek verb ἐργάζομαι uses the "perfect middle in the middle or the passive sense." *Vide* Herbert Weir Smyth, Greek Grammar rev. by Gordon M. Messing (Cambridge, Mass.: Harvard University Press, 1984), 221 #813d.

[10] The passage (τὸ δ' οὐκ ἦν προεξειργασμένον) is to be understood as a periphrasis for the pluperfect passive tense (explained below).

πραγματεία that were brought to a completion, until the Topics and the Sophistical Refutations.

The ambiguity of οὐ τὸ μὲν ἦν τὸ δ' οὐκ ἦν προεξειργασμένον, is in connection with οὐ τὸ μὲν ἦν. Aristotle first states in this section that οὐ τὸ μὲν ἦν, that 'one was not;' so that there was not one πραγματείας prior to Aristotle. But Aristotle immediately connects οὐ τὸ μὲν ἦν, ωι-τη τὸ δ' οὐκ ἦν προεξειργασμένον, which roughly translates as 'and one has not been worked out before,' or, 'and one has not been previously accomplished,' or, 'and one had not been previously achieved.' So the sense of πραγματείας seems to be that 'neither was there one, nor had there been one worked out' prior to the Sophistical Refutations. But why does Aristotle say first, that there was not one πραγματεία, and then immediately say next that there was not one πραγματεία that had been worked out before? Clearly, if there were no prior inquiries on logic at present, then there would indeed be no prior inquiries on logic that would have existed before the Sophistical Refutations. There was no need for Aristotle to also state that there were no prior inquiries on logic that had been 'worked out before,' or, 'previously achieved,' or 'previously accomplished.' The near-redundant meaning of the consecutive phrases, οὐ τὸ μὲν ἦν, and τὸ δ' οὐκ ἦν προεξειργασμένον,' creates some ambiguity concerning the status of πραγματεία, or prior works on logic. It is in this way that this section in the passage from the Sophistical Refutations is ambiguous.

What could this strange section mean? The key to conjecturing about this section may lie in understanding the Greek conjunction δὲ, which connects the two redundant phrases, οὐ τὸ μὲν ἦν, and τὸ δ' οὐκ ἦν προεξειργασμένον. The conjunction δ', or δὲ, can either be used in an adversative or in a copulative sense, according to Smyth; however, he adds, the "two uses are not always clearly to be distinguished."[11] Since a copulative use of δὲ would

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11 Smyth, 644, #2834.

merely re-emphasize the confusion between the two phrases, the conjunction will be treated here as adversative. In this way, the conjunction δὲ will provide some interesting second readings of this section in the Sophistical Refutations, which will be helpful to this inquiry into the received pre-Aristotelian history of the development of logic.

By being used as a conjunction in an adversative sense, δὲ has the meaning of a contrast, which means that the phrase that precedes it is one opposed, or contrary, to the phrase that follows it. The adversative conjunction δὲ can also mean that an objection or a correction is being initiated by the connecting phrase; hence, it can be rendered into English as 'on the contrary,' 'whereas really,' and 'but in fact.'[12]

In this way, this section from the passage in the Sophistical Refutations may also read:

Not that there was one; on the contrary, there was not one that had been worked out before.	οὐ τὸ μὲν ἦν τὸ δ' οὐκ ἦν προεξεφγασμένον.
Or,	
Indeed, there were none, but there were none that had been worked out before.	οὐ τὸ μὲν ἦν τὸ δ' οὐκ ἦν προεξεφγασμένον.

What is striking in both of these alternative translations is the sense that Aristotle is attempting to explain the first clause with the participle in the second clause. For the participle προεξεφγασμένον suggests that the reason

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[12]*Ibid* . Smyth says that when δὲ is balanced by μὲν, such as in the passage, (οὐ τὸ μὲν ἦν τὸ δ' οὐκ ἦν...) that the meaning is more antithetical than merely adversative (644). He says later (656, #2904) that it "is sometimes to be rendered by 'on the one hand... on the other hand,' or, 'indeed, but...,' but is often to be left untranslated.

Aristotle gives his readers as to why there were no prior πραγματείαι on logic is because there was not one finished, or brought to a completion, until the end of the Sophistical Refutations. This implies that prior to the Topics and the Sophistical Refutations, there had existed a tradition of πραγματεία, or inquiries on logic, but such inquiries Aristotle deemed incomplete, perhaps in the sense that they were indeed inquiries, but they were not systematic, or they were not conclusive. Or perhaps Aristotle meant that these prior inquiries on logic were left unfinished, or abandoned. In any case, for Aristotle, any prior tradition of πραγματείας dealing with logic was, for him, conclusively οὐκ προεξειργασμένον, 'not achieved.'[13]

This conjecture about a tradition in logic that οὐκ ἦν προεξειργασμενον, (that 'was not achieved,') also holds in an analysis of the final clause in the passage from the Sophistical Refutations: ἀλλ' οὐδὲν παντελῶς ὑπῆρχεν. Both Pickard-Cambridge and Forster translate this clause in a similar fashion, and both seem to miss its ambiguity. For Pickard-Cambridge, ἀλλ' οὐδὲν παντελῶς ὑπῆρχεν translates as "nothing existed at all;" while Forster reads, "nay, it did not exist at all." The clause can be roughly translated in ways different from both Pickard-Cambridge's and Forster's translations, which better emphasizes its ambiguity: such as 'not one was completely beginning,' or, 'no one completely made a beginning.' These rough translations emphasize the vagueness of the adverb phrase, οὐδὲν παντελῶς, which means, 'not wholly,'

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[13] The passage (τὸ δ' οὐκ ἦν προεξειργασμένον) is to be understood as a periphrasis for the pluperfect passive, thus giving the passage the same sense that Pickard-Cambridge had rendered, *i.e.* ,'there was not one (prior logic, or πραγματείας), nor had it been thoroughly done (or worked out) before. But note that even in this rendering the imperfect phrase (οὐ τὸ μὲν ἦν, 'there was not one') precedes this pluperfect passive (τὸ δ' οὐκ ἦν προεξειργασμένον, 'nor had it been worked out before') in position, but not in time. This means that the pluperfect passive phrase serves to elaborate, if not causally explain, the preceding imperfect phrase.

'not altogether,' not completely,' or 'not entirely.' This adverb phrase immediately gives a sense of vagueness to the final verb ὑπῆρχεν, 'beginning.' For it is imprecise to say that a prior logic had 'not completely started,' or had an 'incomplete beginning,' in its development. It invokes degrees or shades of what constitutes a beginning, or a start, with regard to these prior logics, in which one must ask when, and in what sense, such a logic had 'not entirely begun,' or had 'not completely started.' Furthermore, this adverb phrase οὐδὲν παντελῶς not only gives an ambiguous meaning to the final verb ὑπῆρχεν, but also an ambiguous meaning to the subject of the passage overall. It suggests a sense that any the previous πραγματείας on logic had been 'not entirely completed,' or 'not completely finished,' until Aristotle's Topics and the Sophistical Refutations. In short, the passage suggests that inquiries on logic prior to Aristotle existed, but only as 'incomplete beginnings,' 'false starts,' or even, as 'unsatisfactory,' or 'inadequate attempts.' Here, an 'incomplete beginning,' or a 'false start,' would mean that an inquiry on logic was initiated by a pre-Aristotelian philosopher, but which either had been abandoned, or had been completed with many weaknesses. In this way, any previous πραγματεία on logic, for Aristotle, had 'not been worked out before,' or 'had not been previously accomplished,' or 'previously achieved,' because the inquiry on logic did not begin in earnest until the Topics and the Sophistical Refutations.

So, in the translations of both Pickard-Cambridge and Forster, Aristotle is translated to say that there was absolutely no work being done on logic prior to his own contributions. However, the original Greek in this much-regarded passage from the Sophistical Refutations, seems to suggest otherwise. For this passage contains sufficient ambiguity to call into question its use as a proof to justify the originality of Aristotle's contributions to logic. For the passage from the Sophistical Refutations suggests that there were indeed studies in logic prior to Aristotle. It must be imagined, however, that these translators,

along with modern historians of logic, and Aristotle himself, held this prior work in logic with much disrespect. It thus appears that Aristotle's method of logic is not quite justified to be as unique as modern historians of logic have claimed it to be. Nor is Aristotle's claim justified that there were no inquiries in logic prior to his own contributions; that, in the words of modern translators, 'nothing existed at all.'

Though no one can say with certainty whether Aristotle intended to suggest a pre-Aristotelian analytic tradition in this passage from the Sophistical Refutations, it is nonetheless intriguing that the above grammatical analysis of it has elicited the possibility that there did exist such a history of logic prior to Aristotle. The passage suggests that inquiries on logic prior to Aristotle existed, but only as 'incomplete beginnings,' 'false starts,' or even, as 'unsatisfactory,' or 'inadequate attempts,' Here, an 'incomplete beginning,' or a 'false start,' would mean that an inquiry on logic was initiated by a pre-Aristotelian philosopher, but which either had been abandoned, or had been completed with many weaknesses. In any case, it appears Aristotle deemed these prior inquiries either so incomplete, or so inadequate, that he felt they were unworthy of being studied or even being mentioned.[14] This belief that there was neither a finished nor an adequate

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[14] It is strange that Aristotle would imply that there were 'incomplete beginnings' in the development of logic, and yet not make any mention of them, let alone study them in detail, as he would do with other 'incomplete beginnings' of concepts in his other works. In the first books of the Physics and the Metaphysics predominantly, Aristotle would enumerate and evaluate many concepts and views of previous philosophers, treating these concepts and views as the 'incomplete beginnings' of his own views about a particular philosophical subject. But in the works collectively known as the *Organon* , this practice of enumerating and evaluating previous sources is absent, and the views of earlier philosophers are only used as illustrations or as examples for Aristotle's own method of logic. Their views can be found in the Sophistical Refutations at $168^{b}35$, $172^{a}3$-10, $173^{a}9$-11, $173^{b}19$, $177^{b}12$, $179^{b}20$, $182^{b}26$, $183^{b}7$; as well as in the Topics at $104^{b}20$, $105^{b}16$, $112^{a}36$, $140^{a}2$, $140^{b}4$,

development in logic before he completed the Topics and the Sophistical Refutations is also evident in another passage from the Sophistical Refutations. In this passage, Aristotle announces that

> περὶ δὲ τοῦ συλλογίζεσθαι παντελῶς οὐδεν εἴχομεν πρότερον λέγειν ἢ τριβῇ ζητοῦντες πολὺν χρόνον ἐπονοῦμεν.[15]

> Concerning reasoning, we were having absolutely nothing first to say, as we were working hard for a long time wearing away in searching.

In this passage, the word ζητοῦντες, which was translated as 'searching,' can also mean 'inquiring,' 'investigating,' or 'examining.'[16] It gives the statement a sense that Aristotle conducted intensive searches, or inquiries, or investigations in what one may assume were the existing traditions and methods of logic of his day, during the composition of the Topics and the Sophistical Refutations. But it seems, however, these intensive studies of his produced nothing complete or adequate, in the way of a prior tradition, or of any development whatsoever in συλλογίζεσθαι, in the discipline of 'reasoning.'

141^{a}6, 148^{a}6, 148^{a}15, 152^{a}27; Posterior Analytics 71^{a}29, 78^{a}1; and in the Prior Analytics, at 65^{b}19. The Categories and On Interpretation have no such examples of previous views. *Vide* Harold Cherniss, Aristotle's Criticism Of Presocratic Philosophy (Baltimore: The Johns Hopkins Press, 1935; reprint New York: Octagon Books, Inc., 1964), and Aristotle's Criticism Of Plato And The Academy (Baltimore: The Johns Hopkins Press, 1944), for a study of Aristotle's treatment of views of previous philosophers.

15 *Topica Et Sophistici Elenchi, idem* , 250-1, 184^{b}1-3. This is the other passage used by modern historians of logic to justify Aristotle's originality in logic, notably the Kneales, who translate the passage this way: "on the subject of reasoning we had nothing of an earlier date to speak of at all, but were kept at work for a long time on experimental researches." (The Development of Logic , 43).

16 LSJ., 756.

That Aristotle admits he resorted to making an intensive investigation after he could not find anything presentable for study is a rather amazing statement, considering his education at the Academy in Athens with Plato, where it is assumed he must have encountered the many varieties of dialectic found in Plato's dialogues.

And so again, it seems very puzzling that Aristotle had neither mentioned these 'incomplete beginnings,' nor attempted to link the work of any previous philosopher to his own work. It is important that these 'incomplete beginnings' be investigated in order to clear up obscurities surrounding Aristotle's remarks, especially if any prior example of logical analysis proves to be a possible source for the Aristotelian system of logic and its successors.

Section 2: The Reductio Ad Absurdum Prior to Aristotle

This present inquiry intends to name and investigate an example of an 'incomplete beginning' in the development of logic, so as to diminish some obscurities in the history of logic prior to Aristotle. The 'Aristotelian incomplete beginning' to be examined is the appearance of the *reductio ad absurdum* argument in Pre-Socratic philosophy. Judging by its many appearances in Pre-Socratic (as well as Platonic) literature, the *reductio ad absurdum* argument had a preeminent role in logic before Aristotle, but its role was deemed by Aristotle as inadequate, or inconclusive. Aristotle's criticism is due to the *reductio ad absurdum* argument being a weak argument form. It commits what Aristotle calls, the 'fallacy of false cause,' in which the deduction is achieved 'whenever what is not a cause has been added as alongside that of knowing the refutation.'[17] That is, the *reductio ad absurdum* relies on the

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[17] Topica Et Sophistici Elenchi, *idem.* 199, 167[b]21-22. "Ο δὲ παρὰ τὸ <τὸ> μὴ αἴτιον ὡς αἴτιον, ὅταν προσληφθῇ τὸ ἀναίτιον ὡς παρ' ἐκεῖνο γινομένου τοῦ ἐλέγχου." In

falsification of a contradictory hypothesis (which Aristotle meant by the false conclusion), in order to demonstrate the first or beginning hypothesis in the argument (rather than, one would presume, attempting to demonstrate the beginning hypothesis in the argument with first principles, or some other strategy). In the Topics and in the Sophistical Refutations, then, Aristotle is clearly attempting to discredit the use of the *reductio ad absurdum* argument as a philosophical method, or strategy, of demonstration, rather than acknowledging its use and importance in the thought of prior thinkers. For, in Aristotle's sense, the *reductio ad absurdum* argument was an 'incomplete beginning, because it commits the fallacy of false cause. But Aristotle's criticism in no way diminishes the important presence (as well as its use) of *reductio ad absurdum* reasoning in the history of logic prior to Aristotle's contributions.

This thesis intends to reconstruct the role of the *reductio ad absurdum* argument in the extant thought of certain Pre-Socratic thinkers by employing a philological and philosophical methodology on some of the earliest known examples of the argument. In the first chapter, the surviving fragments from a poem attributed to Xenophanes of Colophon will be discussed, because of the presence of a *reductio ad absurdum* argument within the poem. In the second chapter, a *reductio ad absurdum* argument in the poem of Parmenides of Elea will be examined, so as to understand the use and the esteem that the argument possessed in the Eleatic philosophical tradition. The methodology to be employed upon their examples will comprise a two fold approach: first, to identify the logical framework of a *reductio ad absurdum* argument in their examples, and second, to assess the validity of their examples according to certain ancient conceptions of validity, for the purposes

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the Posterior Analytics, ($71^{b}8$) Aristotle held that scientific knowledge of something was derived by a knowledge of a thing's cause. In consideration of the fallacy of 'false cause,' scientific knowledge is read as a knowledge of a thing's true cause.

of better understanding the logical aspects of each example. In some cases, the doxography and grammatical structure of each example will be examined. And unless otherwise noted, all the translations of Greek and Latin are my own original renditions. The methodology will thus illuminate the meaning and the validity of their examples. In this way, the chief intention of this thesis is to augment the history of logic prior to Aristotle, by illuminating the Pre-Socratic tradition of the *reductio ad absurdum* argument.

Although this thesis will only examine the above list of Pre-Socratic thinkers, or, roughly the period in Greek Philosophy from the late 6th to the middle of the 5th Century B.C., the presence of indirect reasoning can be found as early as Homer, and can be identified in several dialogues of Plato, before showing up in Aristotle's first texts on logic.[18] The *reductio ad absurdum* is also prominent in the works of ancient mathematicians.[19] An exhaustive survey of every ancient appearance of the*reductio ad absurdum* argument would undoubtedly follow the entire received history of Greek thought. Hopefully, this thesis will express the importance that the *reductio ad absurdum* argument possessed in the development of Greek thought: by interpreting its earliest appearances as some of the earliest examples of a unique, Pre-Aristotelian method of logic.

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18 Examples of *reductio ad absurdum* arguments in Homer appear in the Iliad (XXIV 563ff.) and the Odyssey (XVI 194ff.). Some of the many examples in Plato's dialogues can be found at Apology (24^{c}-$25^{a}10$); Lysis (214^{e}-215^{a}); Symposium ($201^{a}9$-$201^{b}10$); Parmenides ($130^{b}7$- $130^{d}5$); and Sophist ($252^{a}1$-$252^{d}10$).

19 Aristotle attests to a Pythagorean example (Prior Analytics $41^{a}22$). Examples are found in Euclid (*Vide* The Thirteen Books Of Euclid's Elements, 2nd Ed., Vol.I, trans. Sir Thomas L. Heath, (New York: Dover Publications, 1956) 255- 256, 349-368) and Archimedes (*vide* The Works Of Archimedes, trans. and ed. Sir Thomas L. Heath, (New York: Dover Publications; reissue Cambridge: Cambridge University Press, 1897) 16-20, 39-44, 52-53, and 54-55.

CHAPTER ONE: XENOPHANES OF COLOPHON

Section 1: Introduction Of A Problem.

The earliest philosophical example of a *reductio ad absurdum* argument appears in a series of fragments attributed to Xenophanes of Colophon. The presence of *reductio ad absurdum* reasoning in these fragments is attested by Clement of Alexandria's *Stromata* of the late 1st Century A.D., and also by a standard modern text, Diels/Kranz' Die Fragmente Der Vorsokratiker.[1] Since there is no direct evidence about the date of their composition, this important series of fragments can only be estimated to belong to the period of Xenophanes' own lifetime, which roughly spanned from 570 to 475 B.C.[2] But because there do not appear to be any extant examples from an earlier period of Greek Philosophy, that not only depict the logical framework of the *reductio ad absurdum* method, but do so in a serious, philosophical way, the earliest example of *reductio ad absurdum* reasoning is to be credited to Xenophanes of Colophon on the basis of these fragments from Clement of Alexandria's *Stromata*, and from Diels/Kranz' Die Fragmente Der Vorsokratiker.

A significant problem develops, however. When the arrangement of the fragments in Clement is compared to the arrangement of the fragments in Diels/Kranz, one discovers not only a different *reductio ad absurdum* argument in Diels/Kranz than in Clement, but also a different meaning of the

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[1] Clemens Alexandrinus *Stromata* I-IV, ed., O. Stahlin (Leipzig: J.C. Hinrichs'sche Buchhandlung, 1906) 16, 399-400. Hermann Diels, Die Fragmente Der Vorsokratiker 18th ed. Walther Kranz, Vol.I, (Zurich and Dublin: Weidmann, 1989), 132-133, B11, B14, B15. Bibliographical note: each fragment taken from Die Fragmente Der Vorsokratiker will be cited according to the standard format, *i.e.* DK., page #, [B# (fragment number), line #].

[2] G.S. Kirk, J.E. Raven, & M. Scholfield, The Presocratic Philosophers 2nd Ed., (Cambridge: Cambridge University Press, 1983), 164.

the argument in Diels/Kranz than in Clement. In short, there are two different conclusions of what Xenophanes is supporting by means of his *reductio ad absurdum* argument: one found in Diels/Kranz, and one found in Clement of Alexandria, and they are conclusions which could not both represent the original conclusion of the *reductio ad absurdum* argument of Xenophanes. The differences between these two versions of Xenophanes' argument point to an overall problem of determining the original (or the closest reconstruction of the original) arrangement of the fragments of Xenophanes' argument. The consequences of this problem directly affects understanding the meaning and the validity of Xenophanes' argument: by affecting the interpretation of the argument, and also by affecting the validity of the conclusions that are made on the basis of Xenophanes' premisses. It is this problem of determining the original or best reconstruction of the fragments of Xenophanes' *reductio ad absurdum* argument that will be addressed here (in addition to the identification of the argument as a *reductio ad absurdum* argument), so as to properly interpret the best possible conclusion of the argument, as well as to properly assess its validity.

This chapter will primarily address this logistic and interpretational problem of Xenophanes' *reductio ad absurdum* argument in Clement of Alexandria's *Stromata* and in Diels/Kranz' Die Fragmente Der Vorsokratiker, by critically examining the logical framework, the meaning, and the validity of these ancient and modern arrangements of these fragments of Xenophanes' *reductio ad absurdum* argument. In section 2, Diels/Kranz' arrangement will first be identified as a *reductio ad absurdum* argument: by closely comparing the logical meaning of the arrangement of the fragments in Diels/Kranz, with the logical framework from one of the many *reductio ad absurdum* arguments that are found in Aristotle's Prior Analytics, so as to compare the logical framework of Diels/Kranz' arrangement with the logical

framework from a mature example of an ancient *reductio ad absurdum* argument. The meaning and the logical validity of the conclusion of Xenophanes' argument, as represented in Diels/Kranz, will then be critically examined and assessed in section 3. In section 4, the version found in Clement of Alexandria's Stromata will first be identified as a *reductio ad absurdum* argument, and then the meaning and validity of Clement's conclusion will be critically examined and assessed (by repeating the same assessments that were used to judge the Diels/Kranz version), in sections 5 and 6. In this way, this chapter intends to show the inferior arrangement of the fragments in the Diels/Kranz version, by establishing the version in Clement as the best, and perhaps the original, version of Xenophanes' *reductio ad absurdum* argument.

Section 2: The Logical Framework In The Diels/Kranz Version

The example appears in Diels/Kranz as follows:

11. πάντα θεοῖσ' ἀνέθηκαν Ὅμηρός θ' Ησιοδός τε, ὅσσα παρ' ἀνθρώποισιν ὀνείδεα καὶ ψόγος ἐστιν, κλέπτειν μοιχεύειν τε καὶ ἀλλήλους ἀπατεύειν.[3]	11. Homer and Hesiod have ascribed to the gods Such as are shameful and faulty among men, Theft, adultery, and fraud.

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[3] DK 132, [B11] , fr. Sextus Empiricus, *Adversus Mathematicos* (Sextus Empiricus, Vol. III, "Loeb Classical Library," trans. R.G. Bury (Cambridge, Mass.: Cambridge University Press, 1935, IX 193). The fragment numbers correspond to the order of their appearance in DK. Omitted were fragments B12 (from *Adversus Mathematicos* I 289, "ὡς πλεῖστ(α) ἐφθέγξαντο θεῶν ἀθεμίστια ἔργα, κλέπτειν μοιχεύειν τε καὶ ἀλλήλους ἀπατεύειν," which is a paraphrase of B11; and fragment B13, which is from Aulus Gellius', Attic Nights (*Noctes Atticae* III, "Loeb Classical Library," trans. J.C. Rolfe 18th Ed., (Cambridge, Mass.: Harvard University Press, 1927, III, 11.2), "*alii Homerum quam Hesiodum maiorem natu fuisse scripserunt, in quibus Philochorus et Xenophanes, alii minorem* ," which is unlikely to have had a bearing in the argument, as it states that 'Xenophanes and Philochorus have written that Homer was older than

14. ἀλλ' οἱ Βροτοὶ δοκέουσι γεννᾶσθαι θεούς,
τὴν σφετέρην δ' ἐσθῆτα ἔχειν φωνήν τε δέμας τε.[4]

14. But humans believe the gods to be born,
And to have their own clothes, voice, and human form.

15. ἀλλ' εἰ χεῖρας ἔχον βόες < ἵπποι τ' > ἠὲ λέοντες
ἢ γράψαι χείρεσσι καὶ ἔργα τελεῖν ἅπερ ἄνδρες,
ἵπποι μέν θ' ἵπποισι βόες δὲ τε βουσὶν ὁμοίας
καὶ < κε > θεῶν ἰδέας ἔγραφον καὶ σώματ' ἐποίουν
τοιαῦθ' οἷόν περ καὐτοὶ δέμας εἶχον < ἕκαστοι >.[5]

15. But if oxen, horses, and lions could have hands,
Or could draw with hands and complete work as Man's,
Then horses and oxen would draw pictures of gods
Like horses and oxen, and they would make the body
In such a fashion as each sort possesses.

These fragments, in their order of appearance in Die Fragmente Der Vorsokratiker, bring to light not merely Xenophanes' criticism of Homer and Hesiod's conceptions of the gods, but also a particular genre of Ancient Greek poetry known as Σίλλοι. Σίλλοι are traditionally understood as satirical poems which mock the dogmatic opinions of philosophers and poets.[6] Diels/Kranz maintains the tradition of interpreting these fragments as satirical by cata-

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Hesiod.'

[4] DK 132, [B14] , fr. Clemens Alexandrinus *Stromata* V 109 [II,399,19 St.].

[5] DK 132-133, [B15] , fr. Clemens Alexandrinus *Stromata* V 110 [II,400,1 St.].

[6] Σίλλοι literally means 'squint-eyes' (LSJ., 1598), and applies to this genre of Greek poetry by describing 'a squinting eye from someone's mockery,' *cf.* Curtis Wachsmuth *Sillographorum Graecorum Reliquiae* (Leipzig: B.G. Teubner, 1885), 6. See also Diogenes Laertius, Lives Of Eminent Philosophers, "Loeb Classical Library," Vol.II, trans. R.D. Hicks (Cambridge, Mass.: Harvard University Press, 1925), IX.111.

loging them (with others) under the sub-heading of Σίλλοι in Die Fragmente Der Vorsokratiker.[7] By doing so, the Diels/ Kranz version interprets the meaning of Xenophanes' *reductio ad absurdum* argument, *viz.*, its conclusion, as satirical.[8]

Xenophanes' *reductio ad absurdum* argument in the Diels/Kranz version is identified by comparing and analyzing the fragments with the logical framework of a typical *reductio ad absurdum* argument in Aristotle. A typical *reductio ad absurdum* argument example in Aristotle is as follows:

εἰ τὸ Α καὶ τὸ Β παντὶ τῷ Γ ὑπαρχει,	If A and B belong to all C,
ὅτι τὸ Α τινὶ τῷ Β ὑπαρχει.	(it follows) that A belongs to some B.
εἰ γὰρ μηδενί,	For if not,
τὸ δὲ Β παντὶ τῷ Γ,	then B belongs to all C
οὐδενὶ τῷ Γ τὸ Α:	and A belongs to no C;
ἀλλ' ἦν παντὶ.[9]	but A was belonging to all C.

Its logical framework consists of (1) the premiss, 'A and B belong to all C;' (2) the conclusion drawn from this premiss, 'A belongs to some B;' (3) an hypothesis that is contradictory to the original conclusion, 'not,' (namely, 'A belongs to no B'); (4) a conclusion drawn from this hypothesis, 'A belongs to no C;' and then finally (5) part of the original premiss, 'A was belonging to all C,' which is re-introduced and which contradicts the conclusion drawn from the hypothesis. This framework thereby demonstrates (2) the original conclusion, by showing the absurdity, or the logical impossibility, of denying it.

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[7] The tradition of Xenophanes as satirical poet, or a συλλογραφός (a writer of σίλλοι) was fostered by Timon of Phlius in the 3rd Century B.C. LSJ. 1598. *Vide* page 29, note 23.

[8] This will be argued (below in section 3) as a mis-interpretation.

[9] *Aristotelis . Analytica Priora Et Posteriora* . ed. W.D. Ross (Oxford: Oxford University Press, 1964), 14, 29a37-39.

In this way, fragment B11, which begins Diels/Kranz version of Xenophanes' *reductio ad absurdum* argument, stating that 'Homer and Hesiod have ascribed to the gods/Such as are shameful and faulty among men/Theft, adultery, and fraud,' appears to be (1) the first premiss in the argument; followed by fragment B14, which is the (2) original conclusion drawn from this premiss, 'but humans believe the gods to be born/And to have their own clothes, voice, and human form.' Fragment B15, which states, 'but if oxen, horses, and lions could have hands/Or could draw with hands and complete work as Man's/Then horses and oxen would draw pictures of gods/Like horses and oxen, and they would make the body/In such a fashion as each sort possesses,' represents (3) an hypothesis that is contradictory to the original conclusion; (4) a conclusion drawn from this contradictory hypothesis;' and (5) part of the original premiss which is re-introduced and which contradicts the conclusion drawn from (3) the contradictory hypothesis.

A fuller analysis of this comparison between the Aristotelian *reductio ad absurdum* framework and the Diels/Kranz arrangement will now be given.

In the Diels/Kranz version, fragments B11 and B14 best represent the argument that is to be proven by a *reductio ad absurdum* argument. This argument begins with fragment B11, which states that 'Homer and Hesiod have ascribed to the gods/Such as are shameful and faulty among men/Theft, adultery, and fraud;' and concludes in fragment B14, 'but humans believe the gods to be born/And to have their own clothes, voice, and human form.' The identity of B11 and B14 as (1) the premiss and (2) the conclusion in the Aristotelian framework is based on the interpretation of B11 and B14 as an inductive argument (and doubly so). The inductive argument framework is evident from the passage of particulars in the subject and predicate in B11, to the more universal subject and predicate in B14. The subject 'Homer and Hesiod,' in B11 is generalized by the subject 'humans,' in B14, and the

predicate, 'theft, adultery, and fraud,' in B11, is broadened by the more general human characteristics in the predicate of B14, namely, 'birth, having their own clothes, voice, and human form.'[10] This inductive nature of Xenophanes' argument is significant in two ways. First, it indicates a stronger connection between fragments B11 and B14 than their more arbitrarily arranged

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10 By broadening Homer and Hesiod's improper ascription (of shameful and faulty human characteristics to the gods) to include a more popular religious belief among the Greeks (that the gods possess human characteristics) as another improper ascription, Xenophanes is implying the wrongness of believing that the gods have human characteristics, by suggesting that those who ascribe improper attributes to the gods are just as impious as Homer and Hesiod, who have ascribed improper human attributes (attributes which are manifestly immoral in the human world) to the divine world. Clearly, Xenophanes is not merely criticizing Homer and Hesiod for attributing the gods with immoral human characteristics: he is moreso criticizing human beings in general who believe the gods to have human characteristics *of any sort* (for it would be both impious and improper to do so). It is important in this context to note that in this criticism of the anthropomorphism of popular religious beliefs, Xenophanes is attempting to establish a general conception of piety: one that makes no distinction between particular human beings (such as Homer and Hesiod) and the general class of human beings. This concept of piety importantly emphasizes the propriety, or the 'fittingness,' of an ascription (of some characteristic) to a divine being. The same idea is found in B1: "χρὴ δὲ πρῶτον μὲν θεὸν ὑμνεῖν εὐφρονας ἄνδρας/ εὐφήμους μύθους καὶ καθαροῖσι λόγοις" 'but it is first proper for men in high spirits to praise god with auspicious stories and pure words,' DK. 127, [B1 7-8]. In short, this concept of piety amounts to treating the gods in a proper and fitting way, such as attributing the gods only with proper and fitting attributes, or by praising the gods with suitable words and stories. Even if one were a different sort of animal, such as an ox, it would still be pious to ascribe only proper and fitting attributes to a divine being (as shown below by B15). The importance of conceptualizing piety in this way represents Xenophanes' genuine overall concern for what is proper or 'fitting,' and this will be shown to be important for understanding his *reductio ad absurdum* argument (*vide* Appendix, p.97). This generalized conception of piety is also consistent with Xenophanes' non-anthropomorphic conception of a divine being put forth in B23 (discussed below in section 5).

order in Diels/Kranz. This makes the identification of the fragments as an argument in the Aristotelian *reductio ad absurdum* framework more apparent: in which B11 represents (1) the premiss, and B14 represents (2) the original conclusion drawn from (1) this premiss. Second, its nature as an inductive argument is important for assessing its logical strength, or validity, which will be discussed below in section 3.

In summary thus far, B11 represents (1) the premiss, and B14 represents (2) the original conclusion drawn from (1) the premiss. This original conclusion, moreover, that 'humans believe the gods to be born/And to have their own clothes, voice, and human form.' is what Diels/Kranz interpret as the object of satire in their arrangement of the argument (by ordering these fragments under the heading of Σύλλοι). The satirical nature of this conclusion will be discussed in section 3, after the interpretation (in the Aristotelian *reductio ad absurdum* framework) of fragment B15, the last, yet the most important fragment in Xenophanes' *reductio ad absurdum* argument.

Fragment B15 states, 'but if oxen, horses, and lions could have hands/Or could draw with hands and complete work as Man's/Then horses and oxen would draw pictures of gods /Like horses and oxen, and they would make the body/In such a fashion as each sort possesses.' In the Aristotelian logical framework, fragment B15 represents (3) the hypothesis which is contradictory to (2) the original conclusion; (4) a conclusion drawn from (3) this contradictory hypothesis; and (5) part of the original premiss which is re-introduced, and which contradicts the conclusion drawn from the contradictory hypothesis. In an initial way, fragment B15 carries the burden of representing these parts of the Aristotelian framework simply by following after fragment B14 in Diels/Kranz' arrangement. By following the identified conclusion of the argument to be proved by a *reductio ad absurdum* argument, B15 represents the majority of parts in the Aristotelian *reductio ad absurdum* framework.

The connection between fragment B15 to the preceding fragments in the Diels/ Kranz arrangement is also shown by the inductive relationship of its subject and predicate, to the subject and predicate in fragment B14. In this case, the subject of 'humans' in B14 is generalized by the more universal subject of 'animals' in B15, and the predicate of 'general human characteristics,' in B14 is universalized by the general characteristics of animals,' in B15. The significance of this inductive nature of Xenophanes' *reductio ad absurdum* argument in Diels/Kranz' arrangement indicates the strong connection altogether between fragments B14 and B15, which thus indicates the strong connection of B11, B14, and B15.[11] Through the following grammatical and logical analysis of fragment B15, stronger ties to fragments B11 and B14 will be disclosed by its interpretation as (3) a contradictory hypothesis, as (4) a conclusion drawn from this hypothesis, and as (5) part of the original premiss which contradicts this hypothesis, in the Aristotelian framework.

A grammatical analysis of fragment B15 immediately shows the sense in which B15 is (3) a contradictory hypothesis to (2) the original conclusion. The presence of the Greek conditional particle εἰ, or 'if,' in line 1: ἀλλ' εἰ χεῖρας ἔχον βόες < ἵπποι τ' > ἠὲ λέοντες," indicates a "supposition (in which the εἰ, or 'if,' clause expresses) a supposed or assumed case."[12] The hypothetical nature of B15 is also indicated by the subjunctive tenses in the Greek verbs "ἔχον," and "γράψαι;" they mean, respectively, 'could have,' and 'could draw.' The contradictory nature of B15 is shown in a further grammatical way, by being a

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[11] It is the inductive nature of fragments B11, B14, and B15, which provides the foundation for identifying their arrangement in Diels/Kranz as a *reductio ad absurdum* argument. Their strong inductive nature also suggests that their arrangement is careless, if not arbitrary, since B11 is placed two fragments prior to fragment B14.

[12] Smyth, Greek Grammar, 512, #2280.

'condition contrary to fact.' The 'condition contrary to fact' has the meaning of an unreal statement by expressing a statement that "cannot or could not be realized because (it is) contrary to a known fact."[13] It is indicated in fragment B15 by the presence of the conditional particle εἰ, or 'if,' in the initial clause, or protasis, by the imperfect verb εἶχον, and by the particle κε, in the concluding clause, or apodosis.[14] And so in these grammatical ways, fragment B15 represents (3) an hypothesis contradictory of (2) the original conclusion.

In an implicit way, fragment B15 represents both (3) the hypothesis that is contradictory to the original conclusion, and also (4) a conclusion drawn from this contradictory hypothesis. The original conclusion in B14 states that 'humans believe the gods to have human characteristics.' The meaning of this original conclusion is that human beings make improper portrayals of the gods in their beliefs, for Homer and Hesiod have improperly ascribed them with certain immoral attributes of the human world. The denial of this original conclusion, which is implicitly hypothesized in fragment B15, is that 'it could be possible for humans to believe that the gods do not have human characteristics.' Fragment B15 expresses this hypothetical denial of the original conclusion ('humans could believe the gods not to have human characteristics') by hypothesizing that the gods may have ox-like, horse-like, and lion-like attributes. In this way, fragment B15 implicitly expresses the denial of the original conclusion, by stating that the gods can be attributed with char-

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13 *Ibid.*, 518, #2302; 512-513, #2282, #2284.

14 Since fragment B15 is a 'condition contrary to fact,' the 'fact' contrary to it would be fragment B14. This means that B14 (the original conclusion, that humans improperly believe the gods to have human characteristics) is to be treated as a fact, and B15 (that other animals would improperly attribute the gods with their own characteristics) is to be understood as unrealizable, hence, fantastical and false.

acteristics that are not human. This hypothesis of the non-human character of the gods is expressed in fragment B15, in which the gods and thus represents (3) the hypothesis contradictory to the original conclusion in the Aristotelian *reductio ad absurdum* framework.

Fragment B15 also implicitly represents (4) a conclusion drawn from the contradictory hypothesis in the Aristotelian *reductio ad absurdum* framework. In fragment B15, this intermediate conclusion is drawn from the meaning of the denial of the original conclusion. The meaning of the original conclusion is that 'humans in general make improper portrayals of the gods.' Its denial states that 'humans in general do not make improper portrayals of the gods.' Fragment B15 implicitly expresses this denial by implying that one would not make improper portrayals of the gods, if it is supposed that other animals were to characterize them with their own attributes, just as humans do. The reason why human beings and other animals would not make improper portrayals of the gods is because these portrayals would be made on account of a natural tendency to ascribe the gods with one's own characteristics. For if it is supposed that other animals could ascribe characteristics to the gods as human beings do, then it would be on account of a natural tendency of both humans and other animals to attribute the gods with one's own characteristics; in short, it would be the common habit of all creatures to do so. Whether or not one is an ox, or a horse, or a lion, or a human, it would be a natural tendency to portray the gods 'in such a fashion as each sort possesses. This implies that no species of animal would also be impious to the gods on account of attributing their own characteristics, whether good or bad, to the gods, because it would be a natural tendency for every animal to do so, and a natural tendency would not be an improper, nor an impious tendency. Hence, there would be no improprieties committed by portraying the gods with the characteristics of own's own species; for impiety

(it would seem here) would not be committed by portraying the gods with the attributes of one's own race. In this way, fragment B15 implicitly represents (4) a conclusion drawn from (3) the contradictory hypothesis to (2) the original conclusion in the Aristotelian *reductio ad absurdum* framework.

Finally, fragment B15 also implicitly represents the last part of the Aristotelian framework: the (5) re-introduction of the original premiss, which contradicts (4) the intermediate conclusion drawn from the (3) contradictory hypothesis. This (5) contradiction of the intermediate conclusion is intended to demonstrate the (2) original conclusion, by showing that the denial of (2) leads to a contradiction between the (1) premiss, and the (3) hypothetical denial of the original conclusion. The re-introduction of (1) the premiss (that Homer and Hesiod have ascribed improper characteristics to the gods) is implicitly expressed in fragment B15 by allowing other animals to attribute their own characteristics (rather than those of humans , as humans would do) to the gods. What results are depictions of the gods with conflicting, and, to say the least, improper attributes, for they would be attributed by human beings to have human-like feet, by oxen to have ox-like hooves, and by lions to have lion-like paws. And so B15 represents (5) this last step according to the implicit statement in fragment B15 about the impropriety of attributing the gods with the characteristics of one's own race (whether one is Homer, Hesiod, an ox, horse, or lion). In short, the fragment implies that the gods may still be ascribed with improper attributes if other animals ascribe attributes like humans do (which is to ascribe the attributes of one's own race). In this way, fragment B15 corresponds to the meaning of the (1) premiss (in fragment B11), in which 'Homer and Hesiod have ascribed certain improper human characteristics to the gods.' The contradiction which develops between the (4) intermediate conclusion and the (5) re-introduction of the (1) premiss, is that either one is improper (and, hence, impious) in

believing that the gods possess one's own characteristics, or, (from (4)) one is proper (and pious) in believing that the gods possess one's own characteristics. It is this contradiction which justifys the absurdity, or the impossibility, of the denial of the original conclusion (that 'humans believe the gods not to have human characteristics'). In this way, fragment B15 represents (5) a re-introduction of the (1) premiss, namely, 'Homer and Hesiod have ascribed certain improper human characteristics to the gods,' which contradicts the conclusion drawn from the hypothesis, from the Aristotelian framework.[15] And so the original conclusion, that 'humans do believe the gods to have human characteristics, and in doing so, make improper portrayals of the gods in their beliefs, is demonstrated by *reductio ad absurdum* .[16]

In this way, the Diels/Kranz arrangement of Xenophanes' *reductio ad absurdum* argument follows the Aristotelian framework as follows:

(1) The premiss: 11. Homer and Hesiod have ascribed to the gods/Such as are shameful and faulty among men/Theft, adul-

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15 This connection between B11 and B15 is also founded by the allusion to a creative aspect of portraying the gods with the characteristics of one's own race. Specifically, the connection is seen in the allusion to the creative activities of Homer and Hesiod, and by the hypothetical creative activities of oxen, horses, and lions. The animals in B15 are suggestively given hands, so that they may either write poetry about their gods (like Homer and Hesiod), or draw pictures of their gods (upon vases, *etc.*). Xenophanes is pointing out that portrayals of the gods, even in popular theology, are products of a creative imagination, and not that of divination, *i.e.* they are not true.

16 This contradiction can be more vividly shown to be absurd in its implication of a divine being who could simultaneously possess both human and non-human attributes, such as simultaneously being attributed by humans to have human-like feet, by oxen to have ox-like hooves, and by lions to have lion-like paws. This contradiction implies that it is both proper and improper for a divine being to be ascribed with conflicting characteristics.

tery, and fraud (Homer and Hesiod have ascribed improper characteristics to the gods).

(2) The original conclusion:

14. But humans believe the gods to be born/And to have their own clothes, voice, and human form (humans in general make improper portrayals of the gods).

(3) An hypothesis that is contradictory to the original conclusion (or an hypothesis which denies the original conclusion):

15. But if oxen, horses, and lions could have hands/Or could draw with hands and complete work as Man's, Then horses and oxen would draw pictures of gods/Like horses and oxen, and they would make the body/In such a fashion as each sort possesses (humans could believe the gods not to have human characteristics).

(4) A conclusion drawn from this hypothesis:

(Other animals would not make improper portrayals of the gods, so humans in general do not make improper portrayals of the gods).

(5) Part of the original premiss, which is re-introduced, and contradicts the conclusion drawn from the hypothesis.

(The gods may still be ascribed with improper attributes if other animals ascribe the attributes of their own kind in the same manner that humans do. Thus, either one is improper (and impious) in believing that the gods possess one's own characteristics, or, one proper (and pious) in believing that the gods possess one's own characteristics. Therefore, (by *reductio ad absurdum*) humans believe the gods to have improper human characteristics.[17]

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[17] Fragment B16 in DK conceivably follows as an adjunct to B11, B14 or B15:

Section 3: The Meaning And The Validity.

With the logical framework of the Aristotelian *reductio ad absurdum* identified, it is now clear that this series of fragments (as arranged by Diels/Kranz) possesses the framework of a *reductio ad absurdum* argument. That is, Diels/Kranz reconstructs an argument (stated in fragments B11 and B14) that is proven by a *reductio ad absurdum* argument (stated in fragment B15). In summary, the argument begins with a statement about the improper anthropomorphisms attributed to the gods by Homer and Hesiod (in B11), and infers (in B14) that humans in general also improperly ascribe their own characteristics to the gods. This inference is argued by *reductio ad absurdum* (in B15): that if other animals could ascribe their own characteristics to the gods, then it would be absurd or impossible for humans to believe that the gods possess human characteristics (for it would be pious and proper, and also impious and improper, to ascribe one's own characteristics to the gods). In this way, the inference (in B14) that humans in general improperly ascribe their own characteristics to the gods is demonstrated by *reductio ad absurdum*

There are a number of criticisms concerning Diels/Kranz' arrangement of the fragments of Xenophanes' *reductio ad absurdum* argument. Already, it has been noted that these fragments have been arranged somewhat carelessly (if not arbitrarily),[18] but there are even more serious questions to consider which will suggest the inferiority of the Diels/Kranz arrangement. This section will primarily introduce and discuss three sets of criticisms pertaining

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"Αἰθίοπές τε < θεοὺς σφετέρους > σιμούς μέλανάς τε/Θρῆικές τε γλαυκούς καὶ πυρρούς <φασι πέλεσθαι >" 'Aethopians' gods are snub nosed and black haired/And Thracians' gods are grey eyed and red haired.'

[18] *Vide*, 7, n. 11.

to: the arrangement of the fragments; the reading of satire in the conclusion of Diels/Kranz' arrangement; and an assessment of the validity of the Diels/Kranz-arranged argument.

The inductive nature of B11, B14, and B15 was said to provide the foundation for identifying their arrangement as a *reductio ad absurdum* argument. However, in spite of its inductive compatibility with B14 and B15, there is reason to suspect that B11 need not be included in Xenophanes' argument. This means that the argument may neither have originally included B11, nor have as much of an inductive nature as Diels/Kranz have arranged it to possess. Without fragment B11 in the arrangement (of B11, B14, and B15), the argument demonstrated by Xenophanes' *reductio ad absurdum* would still remain stated by B14, that 'humans in general improperly ascribe their own characteristics to the gods.' The inductive nature of the argument would also remain unchanged, since the subject of 'humans' in B14 was said to be inductively universalized by 'animals' in B15, and the predicate in B14 of 'human characteristics,' was also said to be universalized by the 'characteristics of animals,' in B15. In short, it is possible to arrange Xenophanes' argument without placing fragment B11 as a (1) premiss based on the Aristotelian framework, that 'Homer and Hesiod have ascribed to the gods/Such as are shameful and faulty among men/Theft, adultery, and fraud,' such that it would not cause the meaning of the argument (*viz .*, its conclusion) or its inductive form, to change very much (if at all). This indicates that the close inclusion of the fragment within the context of the argument in Diels/Kranz is deceptive, since the argument does not appear to warrant any mention of the manner in which Homer and Hesiod have depicted the gods. Hence, the argument does not in the same degree possess an inductive form. Because fragment B11 appears not to be needed in Xenophanes' argument, a case is built against the arrangement of the fragments in

Diels/Kranz, in which the arrangement of the fragments appears faulty.

A far more serious criticism concerns the relationship between fragments B11 and B14 with fragment B15. For in spite of the proximities of B11 and B14 to fragment B15 in Diels/Kranz' arrangement, fragment B15 has the power to subvert as well as support the positions in both B11 and in B14. This self-contradictory state of affairs was first hinted at when fragment B15 was identified as (3), (4), and (5) in the Aristotelian framework (in other words, it was identified as having the power to deny and affirm (2) the original conclusion).[19] This significant paradox is due, on a grammatical level, to the presence of the Greek word ἀλλὰ, or 'but,' in line 1 of fragment B15, ἀλλ' εἰ χεῖρας ἔχον βόες < ἵπποι τ' > ἠὲ λέοντες, 'but if oxen, horses, and lions could have hands.' The word ἀλλὰ, or 'but,' has the character of a retort, and its prepositive position in fragment B15 suggests that a retort is countering some preceding statement (such as the statements made in fragment B11 and B14).[20] This word ἀλλὰ, or 'but,' also occurs in the prepositive position in fragment B14 (ἀλλ' οἱ βροτοὶ δοκέουσι γεννᾶσθαι θεούς, 'but humans believe the gods to be born); it also acts as a retort to the previous statement, due to its prepositive position (countering the premiss that 'Homer and Hesiod have ascribed improper attributes to the gods). This suggests that there is some internal opposition between (1) the premiss and (2) the original conclusion: namely, that while Homer and Hesiod have done wrong (from (1)), humans in general have done right (from (2)). But while B14 acts as a retort (in addition to being a conclusion) to B11, fragment B15 more significantly acts as a retort and

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[19] *Vide* pages 6-7.

[20] The Greek word, ἀλλὰ, or 'but,' in fragment B15, is a strongly adversative or contrasting connective, implying "otherness, diversity, (and) contrast." J.D. Denniston, The Greek Particles, 2nd Ed., (Oxford: Oxford University Press 1950) 1.

as a conclusion to both B11 and to B14. In short, B15 both confutes and supports the meanings of both B11 and B14. Fragment B15 is able to support a *reductio ad absurdum* proof of the conclusion that 'humans improperly ascribe their own characteristics to the gods, and is also able to support both the denial of this conclusion, and also the intermediate conclusion drawn from this denial. This suggests, in the very least, that Xenophanes' may not have intended to use fragment B15 against humans in general (B14), or against Homer and Hesiod (B11), on account of his inclusion of the word, ἀλλὰ, or 'but,' in fragment B15. The inclusion of ἀλλὰ, or 'but,' in fragment B15 suggests a sense in which the fragment can paradoxically support and refute the conclusion of the Diels/Kranz arrangement of the argument. And so in this way also, there is the sense in which a mis-reconstruction has potentially occurred in the arrangement of these fragments by Diels/Kranz.

It was initially due to the proximity of these fragments, and the order in which they appear in Diels/Kranz' Die Fragmente Der Vorsokratiker, which invited a comparison and analysis of its logical framework with a *reductio ad absurdum* framework in Aristotle. While it is not denied that there exists a *reductio ad absurdum* argument in these fragments, the meaning of the argument in Diels/Kranz is somewhat suspect.[21] The orig-

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[21] Based on the above criticisms of the arrangement of the fragments in Diels/Kranz, there is also a great deal of conflict within the meanings of each fragment, which may also confuse the meaning the argument in Diels/Kranz overall; for there may be fragments which support the overall satirical intent, but which may not originally belong to the context of the argument. Either one fragment, such as B11, could belong to the context of the argument, or not; and another fragment, such as B15, seems self-contradictory, by both supporting and subverting the (2) original conclusion. Certainly the fragment identified as the original conclusion in their arrangement of the argument can not be interpreted as satirical, as it merely states a fact of popular Greek theology (that the gods have anthropomorphic attributes). These problems of the arrangement of the fragments compound the problem of the overall

inal conclusion in Diels/Kranz, that 'humans in general improperly ascribe their own characteristics to the gods,' is meant to be satirical (according to their categorization in Die Fragmente Der Vorsokratiker as Σίλλοι), and so the object of Xenophanes' satire in Diels/Kranz' arrangement seems to be any human being who anthropomorphizes any divine being. Xenophanes is mocking those who ascribe human-like characteristics to divine beings, by suggesting that lesser animals, such as 'oxen, horses, and lions,' could mimic this human trait (of ascribing one's characteristics to the gods). The satiric effect is twofold: it likens the anthropomorphizing human beings to lesser animals, and it likens the anthropomorphized gods to the gods of these lesser animals.[22] The problem with this interpretation of Xenophanes' satiric intent (as well as the interpretation of all the fragments listed as Σίλλοι in Die Fragmente Der Vorsokratiker), is in its origin: it dates not from Xenophanes' lifetime (6th Century B.C.), but from Timon of Phlius in the 3rd Century B.C.[23] And so it is unlikely that Xenophanes intended the meaning of his

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meaning of the argument, by making it unclear what is meant by the argument's original conclusion.

22 The satiric device of animals who mimic a human trait is a classic literary tradition: Birds and Wasps by Aristophanes, Reynard The Fox, The Fool's Mirror by Nigel, The Prisoner's Exit, Metamorphosis by Apuleius, Gulliver's Travels by Jonathan Swift, Penguin Island by Anatole France, Animal Farm by George Orwell, Insect Comedy by Karel and Josef Capek, Rhinoceros by Ionesco, His Monkey Wife by Collier. From Gilbert Highet, The Anatomy Of Satire (Princeton, N.J.: Princeton University Press, 1962), 177-190.

23 *Vide* page 17, note 7. According to Diogenes Laertius, Timon of Phlius (320-230 B.C.) was a dramatist and poet, who wrote some Σίλλοι as dialogues, "ἐν οἷς ὡς ἂν σκεπτικὸς ὢν πάντας λοιδορεῖ καὶ σιλλαίνει τοὺς δογματικοὺς ἐν παρῳδίας εἴδει...φαίνεται γοῦν ἀνακρίνων Ξενοφάνην τὸν Κολοφώνιον περὶ ἑκάστων, ὁ δ' αὐτῷ διηγουμένός ἐστι, 'in which like a skeptic, he [Timon] abuses and mocks all the dogmatists in parody form...[he] appears questioning Xenophanes of Colophon concerning each one, and [Xenophanes] is a respondent to him [Timon].

argument to be a contribution to the genre of Σίλλοι, since the genre itself dates three centuries after the composition of the argument. This is not to say that Xenophanes' conclusion is not satirical, but only that it is unlikely that the original intent of Xenophanes' argument is satire alone. In this way, it is possible to say that Xenophanes is satirizing Homer, Hesiod, and those who anthropomorphize divine beings, but it cannot be said that satire alone is the original intent of Xenophanes' argument. The grouping of Xenophanes' argument (as well as several other fragments) in Die Fragmente Der Vorsokratiker under the sub-heading of Σίλλοι thus suggests mis-interpretation of Xenophanes' original intent.

Finally, the question concerning the validity of Diels/Kranz' reconstruction of Xenophanes' *reductio ad absurdum* argument must rest upon its nature as an inductive argument. Because each successive fragment depicts an expanding scope of particulars in their subjects and predicates, a strategy for assessing the logical justifications of Xenophanes' premisses in the Diels/Kranz arrangement must involve an inductive (rather than a deductive) system of validity, so as to accommodate its expanding sets of particulars. Furthermore, to accommodate each successive inductive premiss, in addition to the conclusion, this inductive system must be both importative of relevant premisses, and recursive so as to generate an inductive conclusion. To supply this inductive system, there is the ancient method of ἐπαγωγή, or 'induction,' which Aristotle defines as ἀπὸ τῶν καθ' ἕκαστα ἐπὶ τὸ καθόλου ἔφοδος, 'a passage to the universal from individuals.'[24] The example Aristotle gives of an argument based upon this inductive system, is εἰ ἔστι κυβερνήτης ὁ ἐπιστάμενος κράτιστος, καὶ ἡνίοχος, καὶ ὅλως ἐστὶν ὁ ἐπιστά- μενος περὶ ἕκαστον ἄριστος, 'if the

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Lives Of Eminent Philosophers Vol.II [IX.111], 520.

[24] *Topica Et Sophistici Elenchi*, 13, 105[a]13-14.

expert helmsman is the best (as well as the expert charioteer), then the expert is the best one over every one.'[25] Clearly, the passage to the universal conclusion from the particular premisses is seen in the inference Aristotle makes from particular experts, such as the expert helmsman and the expert charioteer, who are the best at what they do, to his conclusion of a generalized concept of an Expert, who is the best over all and which is universally true for every expert. The validity of the example is thereby determined by how each individual premiss relates to the universal conclusion, within this inductive system.[26]

Using this inductive system, the validity of Xenophanes' premisses can be assessed not only in terms of its probability, or likelihood, of being true, but also by determining how the individual premisses in the argument relate to the universal conclusion. On this basis, Xenophanes' *reductio ad absurdum* argument, as it has been reconstructed by Diels/Kranz, is not even a well-formed inductive argument as stipulated by this inductive system borrowed from Aristotle: as their reconstruction lacks a universal conclusion.

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[25] *Ibid*. 105[a]14-16.

[26] However, because this system allows for an infinite number of imported premisses within any argument, due to the system's on-going importation of recursive premisses, any inductive argument within the system will be open-ended, resulting in an incomplete enumeration of premisses to complete a study of the validity of any inductive argument. In short, any inductive conclusion must depend upon a vague or approximate sense of validity, owing to the indeterminacy of an inductive conclusion's relationship to its premisses. This is perhaps why it is acceptable to identify inductive arguments as either 'strong,' or 'weak,' and to assess the validity of inductive arguments as being 'probable,' or 'likely' to be true. *Cf*. Irving M. Copi, Symbolic Logic, 5th Ed., (New York: Macmillan Pub. Co., 1979), 3, 223-226. In Aristotle's example, there is only a likelihood, or a probability, that the conclusion, 'an expert is the best over every one else, which is universally true for every expert,' is valid.

For in the Diels/Kranz reconstruction, there are propositions with their own recursive importation: namely, of subjects whom are able, or hypothetically able, to attribute characteristics to the gods (starting with 'Homer and Hesiod,' and then, 'humans,' and then finally, 'other animals.' But there does not appear to be, in Diels/Kranz' arrangement, a fragment which can be identified as a universal conclusion; and in this way, Xenophanes' argument, as reconstructed in Die Fragmente Der Vorsokratiker, can not be considered to be well-formed.[27] In this way, the validity of the argument is affected by the arrangement of the fragments of the argument, which casts Diels/Kranz' arrangement as a mis-reconstruction of Xenophanes' *reductio ad absurdum* argument.

Section 4: Clement of Alexandria.

When Diels/Kranz' reconstruction of Xenophanes' *reductio ad absurdum* argument is compared with their sources for the fragments, more questions occur pertaining to their reconstruction of the argument. For when the arrangement of the fragments in Die Fragmente Der Vorsokratiker is compared with an arrangement found in Diels/Kranz' oldest source, Clement of Alexandria's 1st Century A.D. work, the *Stromata*, or 'Patchwork,' there is not merely a noticeable difference in the arrangement of the fragments, but a completely different meaning of the argument in Clement. These differences point to at least two more possible reasons for the mis-reconstruction of Xenophanes' argument in Die Fragmente Der Vorsokratiker. First, by transposing the fragment that begins the arrangement of the argument in

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[27] There is, however, a universal conclusion extant in the fragments of Xenophanes that is used in the context of this *reductio ad absurdum* argument (discussed below).

Clement, Diels/Kranz seem to ignore what may have been a fundamental part of Xenophanes' original argument. This omitted fragment from Diels/ Kranz' reconstruction is not only significant to Xenophanes' argument in Clement, but also to Xenophanes' entire contribution to Greek thought. Second, this transposed fragment is replaced in the Diels/Kranz reconstruction of the argument by fragments from Sextus Empiricus' *Adversus Mathematicos* . This results in the attempt by Diels/ Kranz to justify these Sextus Empiricus fragments (pertaining to Homer and Hesiod's characterizations of the gods) by using Clement's ordering of Xenophanes' *reductio ad absurdum* argument (for Diels/Kranz' arrangement borrows the order of the remaining fragments found in Clement's version to complete their reconstruction of the argument). Thus, the reconstruction of Xenophanes' argument in Die Fragmente Der Vorsokratiker is made less certain by its seemingly arbitrary arrangement of the fragments.

This section will first examine the logical framework and the meaning of Xenophanes' *reductio ad absurdum* argument found in Clement of Alexandria's *Stromata*. The examination will consist in applying the same methods used to analyze the Diels/Kranz version of the argument: *viz* ., the Aristotelian models of *reductio ad absurdum* reasoning, and of inductive reasoning, to identify the logical framework and to determine the validity of Clement's version. It will be argued that, from a logical point of view, Clement' s version of Xenophanes' argument possesses the grounds for verifying it as a better reconstruction of Xenophanes' original argument than Diels/Kranz' version. The grounds for preferring Clement's version are as follows: first, that Clement's ordering of the fragments follows the Aristotelian *reductio ad absurdum* framework better than the Diels/Kranz version; and second, Clement's version presents a well-formed argument within the Aristotelian

inductive system, as the fragment replaced in Diels/Kranz and included in Clement best represents a universal conclusion drawn from premisses containing particulars. In this way, Clement's version of Xenophanes' *reductio ad absurdum* argument will represent the better reconstruction of Xenophanes' original argument than in Diels/Kranz.

This significant fragment replaced in Diels/Kranz and included in Clement, listed in Die Fragmente Der Vorsokratiker as B23, has been traditionally understood as one of Xenophanes' most influential contributions to Greek thought, as it both associates him with a unique view of monotheism, and it links him to the views of the later Eleatics (especially Parmenides). Fragment B23 is also important in linking Xenophanes to the *reductio ad absurdum* tradition in Presocratic philosophy, as it serves to link his argument to the other early examples of the *reductio ad absurdum* (especially those of the Eleatics), and also to an interpretation of the nature of the Presocratic *reductio ad absurdum* argument (given in Chapter Three, section 3).

Section 5: The Logical Framework In Clement's Version

Clement's version of Xenophanes' *reductio ad absurdum* argument is found in one of the many contexts in Clement's *Stromata* which deals with the connection between Ancient Greek philosophy and Christian scripture. In the context of Clement's paraphrase of Isaiah 40:18 ('for what do you liken God, and to what comparison do you liken him?'),[28] Xenophanes' *reductio ad absurdum* argument is interpreted by Clement to be an ancient Greek connection to Isaiah's doctrine of the transcendence of God. The importance of

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28 *Stromata* VI [108.4-109.3] , Stahlin, 398-400 *passim* . *Vide* "ΗΣΑΙΑΣ," in *Septuaginta* , Vol.II ed. Alfred Rahlfs, (Stuttgart: Deutsche Bibelgesellschaft 1979), 620

finding Xenophanes' *reductio ad absurdum* argument in this context will be discussed below, because what is of immediate importance is the different appearance of the argument in Clement than in Diels/ Kranz. For only two of the three fragments used by Diels/Kranz were also used by Clement, but a third, which begins the argument in Clement, was replaced by Diels/ Kranz. This important, transposed fragment (fragment B23 in Die Fragmente Der Vorsokratiker), states that εἷς θεός, ἔν τε θεοῖσι καὶ ἀνθρώποισι μέγιστος, οὔτι δέμας θνη- τοῖσιν ὁμοίιος οὐδὲ νόημα, 'there is one god, the greatest among gods and men, not at all like humans in body nor in mind.'[29] In Clement of Alexandria's *Stromata* , this fragment significantly appears at the beginning of Xenophanes' argument, and is then followed by fragment B14 and then fragment B15. In short, Clement of Alexandria's version of Xenophanes' *reductio ad absurdum* argument appears (using Diels/Kranz' numbering) in this way:[30]

23. εἷς θεός, ἔν τε θεοῖσι καὶ ἀνθρώποισι μέγιστος, οὔτι δέμας θνητοῖσιν ὁμοίιος οὐδὲ νόημα.	There is one god, the greatest among gods and men, not at all like humans in body nor in mind.
14. ἀλλ' οἱ Βροτοὶ δοκέουσι γεννᾶσθαι θεούς, τὴν σφετέρην δ' ἐσθῆτα ἔχειν φωνήν τε δέμας τε.	But humans believe the gods to be born/And to have their own clothes, voice, and human form.
15. ἀλλ' εἰ χεῖρας ἔχον βόες < ἵπποι τ' > ἠὲ λέοντες ἢ γράψαι χερσὶ καὶ ἔργα τελεῖν	But if oxen, horses, and lions could have hands/Or could draw with

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40:18,"τίνι ὡμοιώσατε κύριον καὶ τίνι ὁμοιώματι ὡμοιώσατε αὐτόν."

[29] *Stromata* V 109 [II 399, 16 Stahlin] , DK 135, [B23]. The clause, ἔν τε θεοῖσι καὶ ἀνθρώποισι μέγιστος, 'the greatest among gods and men,' will be explained below.

[30] *Stromata* V 109 [II, 399,16 - 400,1 Stahlin] .

ἅπερ ἄνδρες, ἵπποι μέν θ' ἵπποισι βόες δὲ τε βουσὶν ὁμοίας καὶ < κε > θεῶν ἰδέας ἔγραφον καὶ σώματ' ἐποίουν τοιαῦθ' οἷόν περ καὐτοὶ δέμας εἶχον < ἕκαστοι >.

hands and complete work as Man's/ Then horses and oxen would draw pictures of gods/Like horses and oxen, and they would make the body In such a fashion as each sort possesses.

Plainly, Xenophanes' argument takes on a different structure and meaning in Clement's *Stromata* from that in Diels/Kranz. Clement's ordering of the fragments appears to support the statement in fragment B23 because of a *reductio ad absurdum* argument in fragments B14 and B15. And although Clement's version appears to retain the inductive pattern that was first noticed in the Diels/Kranz version, (for the subjects in the argument expand from how humans depict the gods in B14, to how other animals would do so in B15), the Clement version also appears to possess a universal conclusion reasoned from a set of particulars: that it is absurd to attribute the lone, universal god with non-metaphysical characteristics of any sort. These structural and philosophical differences will be especially clear when seen from the following comparative analysis with the Aristotelian *reductio ad absurdum* framework.

To briefly re-state the framework of the Aristotelian model, it was said that it consisted of (1) a premiss; (2) the original conclusion drawn from this premiss; (3) an hypothesis that is contradictory to the original conclusion; (4) a conclusion drawn from this contradictory hypothesis; and (5) part of the original premiss which is re-introduced and which contradicts the conclusion drawn from (3) the contradictory hypothesis, enabling the (2) original conclusion to be proven by a *reductio ad absurdum* of its denial. Comparing this framework with Clement's version yields fragment B23 as both the (1) premiss and (2) the original conclusion drawn from this premiss; followed by fragment B14 representing (3) an hypothesis that is contradictory to the

original conclusion; and then fragment B15 representing (4) a conclusion drawn from this contradictory hypothesis. The last part of the framework seems not to be expressed in the argument, but will be added at the end of this analysis. In short, Clement's version of Xenophanes' *reductio ad absurdum* argument supports the claim made by fragment B23, that 'a singular, supreme being is unlike humans in body and in mind.'

Fragment B23 represents both (1) and (2) on the basis that the fragment can be divided into two statements: the first, which states that 'there is one god, greatest among gods and men,' and the second, which states that such a god is 'not like mortals in body nor in mind.' The fragment can be divided in this way because the first part presents grounds for inferring the second part. For if such a god were greater than other gods, and also greater than humankind, then this greater being would necessarily be different, and thus, be unlike these lesser beings.[31] Clearly, the division of this fragment into (1)

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[31] In a spurious Aristotelian work, Melissus, Xenophanes, And Gorgias, this theological conception of a singular, supreme god being 'greater than other gods and greater than humankind' is re-stated (and has become the modern approach to the meaning of fragment B23): "Now if God is supreme over all, [Xenophanes] says that he must be one. For if there were two or more gods, he would no longer be supreme and the best of all; for then each of the many, being a god, would likewise be supreme. For what God and God's power means is that he is supreme and never inferior, and that he possesses supremacy over all. So far then as he is not superior, he is not God." Melissus, Xenophanes, And Gorgias, trans. T. Loveday and E.S. Forster, in The Complete Works of Aristotle Vol.II, (Barnes), 1545, 977^{a} 24-9. Here, the Xenophanean God is meant to be supreme because of the incompatibility of sharing this supremacy with the other gods. Both Burnet and Barnes follow this approach in interpreting B23 that Xenophanes "argued on purely logical grounds that there could not be a plurality of gods,' *Vide* Jonathan Barnes, The Presocratic Philosophers (London and New York: Routledge and Kegan Paul, 1982), 89-92; *cf*. John Burnet, Early Greek Philosophy 4th Ed., (London: Adam & Charles Black, 1930), 129. Kirk, Raven, and Scholfield, however, plausibly suggest that Xenophanes meant 'gods' in this and in other

premiss and (2) original conclusion depends upon the meaning of the phrase 'greatest among gods and men,' and its meaning has not been ignored by modern commentators. Its accepted meaning by these scholars is that the phrase is a "polar expression," which is a rhetorical device apparently used to emphasize the impact of the statement that 'there is one god.'[32] There is otherwise a great deal of difficulty in reconciling the singular εἷς θεός, 'one god,' in (1) the premiss, with the plural θεοῖσι, 'gods' in (2) the original conclusion.[33] In any case, Xenophanes states his argument (to be supported by *reductio ad absurdum*) by first stating that 'there is one god, greatest among gods and men, and infers from this premiss that such a supreme being is 'not like mortals in body nor in mind.' This inference is made on the basis that *any* being designated as the 'greatest among gods and human-kind,' would be unlike human beings by possessing attributes deemed superior to those of humankind. In this way, fragment B23 can be divided into (1) a premiss (1) and (2) an original conclusion.

Next, fragment B14 represents (3) an hypothesis that is contradictory to the original conclusion, that 'there is one god who is not like humans in body nor in mind.' Fragment B14 states, ἀλλ' οἱ βροτοὶ δοκέουσι γεννᾶσθαι θεούς, τὴν σφετέρην δ' ἐσθῆτα ἔχειν φωνήν τε δέμας τε, 'but humans believe the gods to be

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fragments as a concession "to popular religious terminology" (The Presocratic Philosophers, 170).

32 Burnet 129, note 1; Kirk, Raven & Scholfield, 170; Barnes, 89. A more familiar polar expression is found when Hamlet says "there are more things *in heaven and earth* , Horatio, than are dreamt of in your philosophy." (Act II.1 167-168). Shakespeare, William, The Tragedy Of Hamlet, Prince Of Denmark (New York: Washington Square Press 1959), 32.

33 This problem is magnified by the many other instances in which Xenophanes refers to a single god (B1, B23, B24, B25, B26, & B38), and many gods (B1, B11, B14, B15, B16, B18, B23, and B34). *Cf*. DK. 126-138.

born/And to have their own clothes, voice, and human form.' What is first noticed are the strong contrarieties (rather than any hypothesized contradiction) between fragment B14 with (2) the conclusion of fragment B23, and this feature is solely found in Clement and not in Diels/Kranz.[34] These contrarieties not only involve the presence of one god in B23 versus the presence of many gods in B14, but also involves the unlikeness of the singular supreme being to human beings in B23, versus the likeness of many deities to human beings in B14. This double contrariety is also signalled on a grammatical level, by the Greek adversative, ἀλλ' (ἀλλὰ), 'but,' in line 1 of fragment B14: ἀλλ' οἱ βρο- τοὶ δοκέουσι γεννᾶσθαι θεούς, 'but humans believe the gods to be born.' In short, there are some strong contrasts being made between part of B23 (*viz.*, the (2) conclusion that a supreme being is 'not like mortals in body nor in mind'), and the whole of fragment B14 (*viz.*, (3) the contradictory hypothesis,) 'but humans believe the gods to be born/And to have their own clothes, voice, and human form.' It will be shown next how these strong contrarieties between fragments B23 and B14 contribute to the identity of B14 as (3) a hypothesis contradictory of (2) the original conclusion.

For what is being contradicted in part of fragment B23 by fragment B14 is the same statement pertaining to the anthropomorphic attributes ascribed to the gods as that in the Diels/Kranz version. That is, fragment B23 expresses a complete rejection that any kind of god has anthropomorphic attributes, or even has remote similarities, to human beings. To say that a Supreme Being is 'not like humans in body nor in mind,' as B23 states, means that such a Supreme Being would not possess any anthropomorphic attributes, since such a Supreme Being would not possess any similarity to human beings. To

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34 In DK, the polytheism of B14 has already been stated by B11,1: πάντα θεοῖσ' ἀνέθηκαν Ὅμηρός θ' Ἡσιοδός τε, 'Homer and Hesiod have ascribed to the gods.'

state the contradiction of B23, as it appears in Clement's version, is to say that more than one god possesses anthropomorphic attributes (or, as B14 states, humans believe that there are many gods who possess human-like attributes). In this way, fragments B23 and B14 could have the logical notation 'P v -P,' as they express the disjunction that 'either there is one God who is unlike humans' (P), or 'there are many gods who are like humans' (-P). And so, since fragment B14 states that there are more than one god who possesses attributes similar to mortals, by stating that 'humans believe the gods to be born/And to have their own clothes, voice, and human form,' fragment B14 can be identified as (3) a hypothesis contradictory of (2) the original conclusion.

Thus far, Clement's version of the argument can be understood in this way:

(1) The premiss: 23. εἷς θεός, ἔν τε θεοῖσι καὶ ἀνθρώποισι μέγιστος, 'There is one god, the greatest among gods and men.' This Supreme Being is necessarily different from other beings.

(2) The conclusion: οὔτι δέμας θνητοῖσιν ὁμοίιος οὐδὲ νόημα. 'not at all like humans in body nor in mind.' This singular supreme being does not possess any anthropomorphic attributes.

(3) An hypothesis that is contradictory to the original conclusion. 14. ἀλλ' οἱ Βροτοὶ δοκέουσι γεννᾶσθαι θεούς, τὴν σφετέρην δ' ἐσθῆτα ἔχειν φωνήν τε δέμας τε. 'But humans believe the gods to be born/and to have their own clothes, voice, and human form.' More than one god possesses more than one human likeness.

Fragment B15 represents, in Clement's version, (4) a conclusion drawn from the contradictory hypothesis in B14. Fragment B15 represents an intermediate conclusion from B14 (that humans ascribe their own characteristics to the gods') by stating that 'other animals would also ascribe their own characteristics to divine beings.' This intermediate conclusion is easily discernible in fragment B15, due to an inductive shift in the elements of B14 to B15: from 'humans,' 'the gods of humans,' and 'the anthropomorphic attributes of the gods of humans,' in fragment B14, to 'animals,' 'the gods of animals,' and the 'ascription of like-attributes to the gods of animals,' in fragment B15. In this way, an inductive intermediate conclusion is expressed in fragment B15, which positively identifies it as a (4) conclusion drawn from (3) an hypothesis contradictory to the original conclusion.

Finally, the last part of the Aristotelian framework, (5) part of the original premiss which is re-introduced and which contradicts the conclusion drawn from (3) the contradictory hypothesis, is unstated in Clement's version of Xenophanes' argument. Yet due to the picture of absurdity drawn in B15, the final conclusion of Clement's version is rather obviously deduced. The (4) intermediate conclusion from the (3) contradictory hypothesis stated that 'other animals would also ascribe their own characteristics to divine beings.' This conclusion results in an absurd state of affairs in relation to the (3) contradictory hypothesis, that 'more than one god possesses more than one human likeness.' In other words, what results are deities who possess a myriad of different attributes from many different animals. This is a logically impossible result; clearly, a deity cannot possess all of the attributes ascribed to it by humans and other animals. The absurdity reduces the anthropomorphic conception of gods in fragment B14, 'but humans believe the gods to be born, and to have their own clothes, voice, and human form,' to absurdity. In this way, the (3) contradictory hypothesis in Clement's version of the

argument is refuted. And thus, the (2) original conclusion, that there is a god who is (2) 'unlike humans in body and in mind,' demonstrated by *reductio ad absurdum* .

Clement's version thus follows the Aristotelian logical framework in this way:

(1) The premiss:

23. εἷς θεός, ἔν τε θεοῖσι καὶ ἀνθρώποισι μέγιστος, 'There is one god, the greatest among gods and men,' This Supreme Being is necessarily different from other beings.

(2) The conclusion:

οὔτι δέμας θνητοῖσιν ὁμοίιος οὐδὲ νόημα. 'not at all like humans in body nor in mind.' This singular supreme being does not possess any anthropomorphic attributes.

(3) An hypothesis that is contradictory to the original conclusion.

14. ἀλλ' οἱ Βροτοὶ δοκέουσι γεννᾶσθαι θεούς, τὴν σφετέρην δ' ἐσθῆτα ἔχειν φωνήν τε δέμας τε. 'But humans believe the gods to be born/and to have their own clothes, voice, and human form.' More than one god possesses more than one human likeness.

(4) A conclusion drawn from this contradictory hypothesis.

15. ἀλλ' εἰ χεῖρας ἔχον βόες < ἵπποι τ' > ἠὲ λέοντες ἢ γράψαι χείρεσσι καὶ ἔργα τελεῖν ἅπερ ἄνδρες, ἵπποι μέν θ' ἵπποισι βόες δὲ τε βουσὶν ὁμοίας καὶ < κε > θεῶν ἰδέας ἔγραφον καὶ σώματ' ἐποίουν τοιαῦθ' οἷόν περ καὐτοὶ δέμας εἶχον < ἕκαστοι >. 'But if oxen, horses, and lions could have hands/Or could draw with hands and complete work as Man's/Then horses and oxen would draw pictures of gods/ Like horses and oxen, and they would

	make the body/ In such a fashion as each sort possesses. Other animals would also ascribe their own characteristics to divine beings.
(5) Part of the original premiss which is re-introduced and which contradicts the conclusion drawn from (3) the contradictory hypothesis, enabling the original conclusion to be proven by a *reductio ad absurdum* of its denial.	(Unstated: 'it is logically impossible that the gods who are ascribed to resemble humans (and other animals) possess all of the attributes ascribed to them by humans and other animals.' (2) Therefore, it is false to state that there is more than one god who possesses a resemblance to human beings. And so, by *reductio ad absurdum* ,there is one god who is not like mortals in body nor in mind).

Section 6: The Meaning And The Validity of Clement's Version.

The meaning of Clement's version of Xenophanes' *reductio ad absurdum* argument is clearly more theological than the meaning found in the Diels/Kranz version. Clement's version presents a *reductio ad absurdum* argument in support of the conclusion that a divine being is unlike human beings in body and in mind. The context of this conclusion in Clement's book emphasizes the transcendence of the Christian God, as put forth by Isaiah.[35] In the Diels/Kranz version, the conclusion of Xenophanes' argu-

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35 The concept of God in Isaiah presents an interesting comparison to Clement's version of Xenophanes' argument. Clearly, Isaiah's god is very much 'unlike humans in body and in mind': He is a being who 'stands as Heaven's ceiling and extends as a tent to dwell in,' and who 'confines the Earth's circle,' and who 'created the law-givers to rule into nothing and the Earth into nothing.' (*Isaiah* 40 : 22-23).

ment is that humans in general improperly ascribe their own characteristics to the gods, and by cataloging this conclusion (along with the rest of the argument) under the sub-heading of Σίλλοι, Diels/Kranz interprets its meaning as satirical towards human beings. In this way, the meaning of Clement's version is clearly more theological than Diels/Kranz, as the Diels/Kranz version assumes a more literary meaning than the Clement version.

However, for reasons that will be addressed in this section, Clement's version represents a better arrangement of the fragments and a better representation of the original meaning of Xenophanes' argument than the Diels/Kranz' version. The inferiority of the Diels/Kranz version has already been shown from the questionable arrangement of the fragments, the 3rd Century B.C. origin of its satirical meaning, and from the inability to assess the validity of the conclusion. Clement's version, meanwhile, presents itself as the better reconstruction of Xenophanes' argument because of its meaning and its potential for assessing its validity. In other words, it is due to the inclusion of fragment B23 in Clement's version which accords Clement's version as the better, if not representing the original, version of Xenophanes' argument.

The authority for Clement's version can be immediately established by pointing out that Diels/Kranz' version is made up of fragments from Clement's version, but with an important difference. Diels/Kranz' version begins with a fragment taken from Sextus Empiricus' *Adversus Mathematicos* : πάντα θεοῖσ' ἀνέθηκαν Ὅμηρός θ' Ησιοδός τε, ὅσσα παρ' ἀνθρώποισιν ὀνείδεα καὶ ψόγος ἐστιν, κλέπτειν μοιχεύειν τε καὶ ἀλλήλους ἀπατεύειν, 'Homer and Hesiod have ascribed to the gods Such as are shameful and faulty among men, Theft, adultery, and fraud.' Diels/Kranz' version proceeds to use fragments taken from the *Stromata* of Clement (B14 and B15), to reason that all human beings

improperly ascribe human attributes to the gods. The problem here is that while Diels/Kranz is drawing from both Sextus Empiricus and Clement of Alexandria for their version of the argument, it is likely that Clement of Alexandria was drawing from an older source than Sextus for his version of the argument. In this way, the authority for Clement's version is established by this hypothetical older source, as opposed to the authority of Diels/Kranz' version, which is contaminated by the Sextus Empiricus text. Drawing from Sextus Empiricus for Diels/Kranz' version of the argument in this way both serves to misrepresent Xenophanes' original argument, and to supports Clement's version as a better, if not the original, version of Xenophanes' argument.

Clement's version of the argument also represents a better interpretation of the meaning due to the significance of fragment B23. Fragment B23, εἷς θεός, ἔν τε θεοῖσι καὶ ἀνθρώποισι μέγιστος, οὔτι δέμας θνητοῖσιν ὁμοίιος οὐδὲ νόημα, 'there is one god, the greatest among gods and men, not at all like humans in body nor in mind,' is not only significant in Clement's Christian context (*re :Isaiah*): B23 is also significant in its possible influence on Eleatic philosophy in 5th Century B.C. Italy. In other words, Clement's version represents the better (if not the original) version of Xenophanes' argument because its position that there is a singular metaphysical being, εἷς θεός (one god), accords with a tradition of maintaining Xenophanes' thought as an influence upon the Eleatic philosophers. Despite modern criticism (see note 39 below), the tradition of Xenophanes' influence upon Eleatic thought is attested by no less than Plato, Aristotle, and Theophrastus. In the Sophist, the Eleatic Stranger remarks that τὸ δὲ παρ' ἡμῖν Ἐλεατικὸν ἔθνος, ἀπὸ Ξενοφάνους τε καὶ ἔτι πρόσθεν ἀρξαμενον, ὡς ἑνὸς ὄντος τῶν πάντων καλουμένων οὕτω διεξέρχεται τοῖς μύθοῖς, 'and the Eleatic group, beginning with Xenophanes and yet before, will go through the

myths thus, calling all things as of one being.'[36] Aristotle states, Ξενοφάνης δὲ πρῶτος τούτων ενίσας (ὁ γὰρ Παρμενίδης τούτου λέγεται γενέσθαι μαθητής) οὐδὲν διεσαφήισεν, οὐδὲ τῆς φύσεως τούτων οὐδετέρας ἔοικε φιγεῖν, ἀλλ' εἰς τὸν ὅλον οὐρανὸν ἀποβλέψας τὸ ἕν εἶναι φησι τὸν θεόν, 'and Xenophanes, the first of these monists (for it is said Parmenides came to be a disciple) said clearly on the Nature of these things nothing at all, nor what is fitting to handle, but one looking upon the entire heaven, he is saying that the one is God.'[37] And Simplicius reports the words of Theophrastus: μίαν δὲ τὴν ἀρχὴν ἤτοι ἕν τὸ ὂν καὶ πᾶν καὶ οὔτε πεπερασμένον οὔτε ἄπειρον οὔτε κινούμενον οὔτε ἠρεμοῦν Ξενοφανη τὸν Κολοφώνιον τὸν Παρμενίδου διδάσκαλον ὑποτίθεσθαι φησιν ὁ Θεοφραστος ὁμολογῶν ἑτέρας εἶναι μᾶλλον ἢ τῆς περὶ φύσεως ἱστορίας τὴν μνήμην τῆς τούτου δόξης. τὸ γὰρ ἕν τοῦτο καὶ πᾶν τὸν θεὸν ἔλεγεν ὁ Ξενοφανης, 'and truly the first one to originate Being as one and whole and neither limiting nor unlimited, nor moving, nor resting, was Xenophanes of Colophon, the teacher of Parmenides, says Theophrastus, who is another one agreeing that there is more concerning nature than the memory of this opinion. For Xenophanes was saying this one and all was God.'[38] However, in spite of this ancient testimony, the Xenophanean connection to Eleatic philosophy is disputed by modern scholars.[39] It is plausible,

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[36] *Platonis*, *Sophista*, in *Platonis Opera*, Vol.I, ed. J. Burnet (Oxford: Oxford University Press, 1900), 399, 244^{d}5.

[37] *Aristotelis*, *Metaphysica*, ed. W. Jaeger (Oxford: Oxford University Press, 1957), 16, 986^{b}21-25.

[38] From Hermann Diels, *Doxographi Graeci*, 4th Ed., (Berlin: Verlag Walter de Gruyter & Co., 1965), 480, fragment 5, lines 4-8. Also in Simplicius, *In Aristotelis Physicorum Libros Quattuor Priores Commentaria*, ed. Hermann Diels, (Berlin: George Reimer, 1882), 22, lines 26-30.

[39] Notably in Karl Reinhardt, Parmenides Und die Geschichte der greichischen Philosophie (Bonn: Friedrich Cohen, 1916; reprint Frankfurt a . M. : Vittorio Klosterman, 1959); John Burnet, Early Greek Philosophy, 127; Werner Jaeger, The Theology Of The Early Greek Philosophers (Oxford: Oxford

nonetheless, that Parmenides was instructed by Xenophanes at some point, or had heard of the monistic theism of Xenophanes (expressed in B23 and in others).[40] This ancient tradition of connecting Xenophanes with Eleatic philosophy, in this way, attests to the monistic theological position expressed in Clement's version of Xenophanes' *reductio ad absurdum* argument, rather than to the position expressed in the Diels/Kranz version (pertaining to the ascription of improper attributes by human beings). And so it is also due to the possible influence of B23 in Eleatic philosophy which accords Clement's version as the better, if not representing the original, version of Xenophanes' argument.

Clement's version also represents a better reconstruction of the fragments of Xenophanes' argument on the basis of its potential for assessing its validity. Unlike the version in Diels/Kranz, Clement's version represents a well-formed inductive argument, as it clearly shows a passage to a universal conclusion from particular premisses (which had been the requirement stipulated by the Aristotelian inductive system, and missed in the Diels/Kranz version). This universal conclusion in Clement's version is found in the original and final conclusion that there is a single deity who is 'unlike humans in body and in mind.' It is an inductive argument (*viz* ., a contra-

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University Press, 1947), 51-54; Kirk, Raven, & Scholfield, The Presocratic Philosophers, 165-166; Jonathan Barnes, The Presocratic Philosophers, 83. The consensus of these scholars is that "these playful and ironical remarks of Plato's were taken seriously by his successors,"(Jaeger); and that they were "not necessarily intended as a serious historical judgement," (Kirk, Raven, & Scholfield); and in fact, that "the opposite influence is chronologically possible, and has been staunchly maintained,' (Barnes).

[40] Xenophanes is claimed by Diogenes Laertius to have lived in Southern Italy, and also to have composed a poem titled Ἐλέαν τῆς Ἰταλίας ἀποικισμὸν, 'The Settlers At Elea In Italy." Lives Of Eminent Philosophers Vol.II, [IX.20] 428.

dictory hypothesis to (2) the original conclusion, and a conclusion drawn from this hypothesis), that 'humans believe the gods to be born/And to have their own clothes, voice, and human form,' and that 'other animals would also ascribe their own characteristics to divine beings,' which implies this universal conclusion. In other words, fragment B14 and B15 represent the 'passage to the universal from individuals,' by showing a recursive importation, or inductive augmentation, of premisses containing individual subjects. These 'premisses containing individual subjects' concern beings presumed to attribute characteristics to more than one god, with the outcome (based on the absurdity of these premisses) intending to justify the universal conclusion that 'there is one god who is not like humans in body nor in mind.' It due to this potential for assessing its validity that the Clement version also stands as a better re-construction of Xenophanes' argument than the Diels/Kranz version.

An assessment of the validity of Clement's version of Xenophanes' argument must now be attempted. Because the validity of the universal conclusion in Clement's version is justified by the strength of its inductive premisses (culled from the contradictory hypothesis and its intermediate conclusion, or fragment B14 and B15), these inductive premisses must be assessed for their 'inductive strength.' This sense of 'inductive strength can be shown by a strong inclusivity of individuals in the argument. This strong inclusivity of individuals is the result of a recursive importation of premisses required to support a universal conclusion. For example, Aristotle imports two individuals to support his inductive argument, the expert helmsman representing the best helmsman among helmsmen, and the expert charioteer representing the best charioteer among charioteers, which support his universal conclusion that any expert is the best over any other. The strong inclusivity of Aristotle's argument, then, rests with these two individual

experts, from which it is inferred that every expert is the best over any other. To assess the validity of Aristotle's argument one would inquire whether Aristotle's universal conclusion would be strongly inclusive of every expert being the best over everyone else, on the basis of the two individual experts named in the argument. And Aristotle's example would be valid, provided that helmsmen and charioteers were the only possible experts (hence, they would also be the only possible representatives of who was the best among others.) This is because the universal conclusion implies that there are more experts, or more individuals, than those included by Aristotle in his argument.[41] And so the validity of Aristotle's inductive argument must rest with the probability or the likelihood that the universal conclusion is true on the basis of the individuals included within the argument. In other words, the stronger the inclusivity of individuals within the argument, the more likely or probable the universal conclusion's validity will be.

With this in consideration, the validity of Clement's version of Xenophanes' argument rests upon the strong inclusivity, or importation, of premisses expressing individual physical and mental dissimilarities between the singular supreme being with mortal beings. The premisses showing these individual dissimilarities are inferred from the indirect argument in Clement's version of Xenophanes' argument,*viz.*, by the refutation of (3),

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41 This is easily shown by symbolizing Aristotle's argument as $(T^1 \cdot T^2) \supset T^n$, in which (T^1) and (T^2) represent instances of an expert representing the best over anyone else, and (T^n) representing every instance of an expert representing the best over anyone else: such that if the individual instances of an expert helmsman and the expert charioteer represent the best among other helmsman and charioteers (T^1 and T^2), then any expert is the best among others (T^n). Thus, Aristotle's argument displays a weak inclusivity of individuals in the argument, and hence, represents an example of weak induction, since it does not diminish the sense in which there were more experts implied in the universal conclusion than in the individual premisses.

that the attributes of any supreme being and the attributes of human beings are alike. Thus, Clement's version represents the 'passage to the universal from individuals,' by showing a recursive importation, or inductive augmentation, of premisses containing individual subjects, in this way:

1. A singular supreme being was not created (or born) like mortal beings.

2. A singular supreme being does not wear clothes like mortal beings.

3. A singular supreme being does not have a voice like mortal beings.

4. A singular supreme being does not have a form like any human being.

5. A singular supreme being does not have a form like any ox.

6. A singular supreme being does not have a form like any horse.

7. A singular supreme being does not have a form like any lion.

The inductive conclusion of these individuals is then added to complete the argument thus:

8. Therefore, a singular supreme being is not like mortal beings in body or in mind.

The question with which to best assess the validity of the conclusion has already been formulated, *viz* ., do the individual premisses strongly or weakly support the universal conclusion by shown a strong (or weak) inclusivity of

individuals in relation to the universal. The individual dissimilarities of (2) apparel, (4) a human-like form, (5) an ox-like form, (6) a horse-like form, and (7) a lion-like form, immediately suggest a degree of support for the universal conclu- sion. For a singular supreme being would be dissimilar in form to mortal beings if the form of the supreme being did not resemble (4) a human-like form; (5) an ox-like form; (6) a horse-like form; or (7) a lion- like form. It is even less likely that the singular supreme being would (2) wear clothes like mortal beings.[42] Thus, the argument shows at least a weak inclusivity of individual similarities in relation to the universal conclusion.

But with the individual dissimilarities of (1) birth and (3) voice, however, the support for a universal dissimilarity of body and mind between mortal and a singular supreme being is far more complex to assess. The individual dissimilarity of (3) voice may support a physical dissimilarity between a singular supreme being and mortal beings, in the sense that the Greek word φωνήν in fragment B14 signifies a bodily-produced sound; however, it may also support a mental dissimilarity in the sense that the sound could also represent a mental state.[43] But it may also support neither a physical nor a mental dissimilarity, since there is neither an explicitly cognitive, nor an explicitly physiological meaning in Xenophanes' argument for the word φωνήν. Due to this uncertainty, the individual dissimilarity of (3) voice does not readily add any strength in support of (5) the universal conclusion. And finally, the individual dissimilarity of (1) birth does not lend inductive

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42 Both B14 and B23 use the same word for the word 'form' (δέμας) which also means "bodily frame." LSJ. 378.

43 Sound representing a mental state is what Plato has in mind by defining thought (λόγος) in the Sophist as Τὸ δέ γ' ἀπ' ἐκείνης ῥεῦμα διὰ τοῦ στόματος ἰὸν μετὰ φθόγγου κέκληται λόγος, 'the stream which flows from the mind through the lips with sound is called thought.' *Platonis Opera* I, 435 (263e7-8).

strength to the universal conclusion. Birth, which pertains to a thing's beginning, rather than to a thing's physical or mental state, does not have any connection with the mental or physical dissimilarities between mortal beings and a singular supreme being. Only in virtue of the individual premisses of (2) apparel, (4) a human-like form, (5) an ox-like form, (6) a horse-like form, and (7) a lion-like form, would the validity of the universal conclusion be supported.

It is on this basis that Clement's version of Xenophanes' *reductio ad absurdum* argument is a weak inductive argument. For the premisses expressing individual dissimilarities between a singular supreme being and mortal beings weakly support the universal conclusion that the singular supreme being is dissimilar to mortals in body and mind. The argument in Clement shows a weak inclusivity of individuals in relation to the universal, which means that the conclusion can imply more individual dissimilarities than are included by the premisses (since there are many more animals than are included in the individual premisses.). Clement's version of the argument also includes individual dissimilarities, such as voice and birth, which have little or nothing to do with the general dissimilarities in the universal conclusion.

Thus, Clement's version of Xenophanes' argument is valid only in a weak inductive sense, and the universal conclusion that 'a singular supreme being is not like mortal in body or in mind' is not too likely to be true.

The above exercise of assessing the validity of Clement's version was primarily important in showing how the version in Clement's *Stromata* represents a better reconstruction of the Xenophanes *reductio ad absurdum* argument than the version in Die Fragmente Der Vorsokratiker. The most important difference between the two versions, as it has been stressed, is the inclusion of fragment B23 in Clement's version, that 'a singular supreme being is not like a mortal in body or in mind.' The importance of this differ-

ence appreciably underscores the doxographical and logical problems of the extant *reductio ad absurdum* argument of Xenophanes. The differences substantiate the serious interpretational problems involved with the argument, which effect both the philosophical (or logical) meanings, and also the theological meanings, of Xenophanes' poem. With the aid of an Aristotelian *reductio ad absurdum* framework, and an Aristotelian 'inductive system,' this chapter set upon restoring the best possible meaning for the fragmentary argument, and also attempted to determine the possible validity, or inductive strength, of Xenophanes' argument. What resulted was the best possible reconstruction of the original argument based upon the appearance of the argument in the 1st Century work of Clement of Alexandria. Clement's version supports the metaphysical, universal conclusion that 'a supreme being is unlike humans in body and in mind,' and was shown to possess weak validity because of its weak induction of particulars within the argument. That Xenophanes' argument possesses weak validity makes Aristotle's assessment of all *reductio ad absurdum* arguments (as being an 'incomplete beginning' on the basis of the fallacy of false cause) seems more justified. Nevertheless, the ability of *reductio ad absurdum* reasoning to effect demonstrations of metaphysical conclusions, (as it is displayed in later Presocratic philosophy), was first significantly displayed in Xenophanes' example. On this basis, Xenophanes' *reductio ad absurdum* argument represents the first philosophical use of *reductio ad absurdum* reasoning. Next, the importance of the argument in the school of Eleatic philosophy will be studied through an important example in the philosophy of Parmenides of Elea.

CHAPTER TWO: THE ELEATIC REDUCTIO AD ABSURDUM ARGUMENT

Section 1: Introduction.

By far, the greatest collection of examples of *reductio ad absurdum* reasoning in the extant fragments of the Pre-Socratics are those of Parmenides of Elea, Zeno of Elea, and Melissus of Samos, who are the dominant representatives of Eleatic philosophy. The Eleatics are important representatives in the Pre-Socratic tradition of *reductio ad absurdum* reasoning, as well as in the history of logic prior to Aristotle, for they not only used the *reductio ad absurdum* method as an important tactic for justifying their monistic standpoint on reality (that of ἐὸν, or Being), but they also developed the *reductio ad absurdum* methodology into a formidable tool for metaphysics. In the fragments of Zeno of Elea, for example, there are arguments against a pluralistic view of reality which indirectly justify the Eleatic view of reality as monistic.[1] In this way, Zeno's indirect method of justifying the Eleatic monistic position represents a significant historical development. He represents the historical continuity of the *reductio ad absurdum* methodology from the *reductio ad absur-*

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[1] Zeno's use of *reductio ad absurdum* reasoning derives not from Zeno's extant fragments, but instead from Plato's Parmenides. In this dialogue, Plato interprets a speech given by Zeno as βοήθειά τις ταῦτα [τὰ γράμματα] τῷ Παρμενίδου λόγῳ πρὸς τοὺς ἐπιχειροῦντας αὐτὸν κωμῳδεῖν ὡς εἰ ἕν ἐστι, πολλὰ καὶ γελοῖα συμβαίνει πάσχειν τῷ λόγῳ καὶ ἐναντία αὐτῷ. ἀντιλέγει δὴ οὖν τοῦτο τὸ γράμμα πρὸς τοὺς τὰ πολλὰ λέγοντας, καὶ ἀνταποδίδωσι ταὐτὰ καὶ πλείω, τοῦτο βουλόμενον δηλοῦν, ὡς ἔτι γελοιότερα πάσχοι ἂν αὐτῶν ἡ ὑπόθεσις, εἰ πολλά ἐστιν, ἢ ἡ τοῦ ἓν εἶναι, 'supporting [the Parmenidean writings] by lampooning those who attack the Parmenidean argument (for the attackers of Parmenides achieved) results by causing much laughter and self-contrariety. This writing strongly contradicts the ones who assert 'the many,' and so this clear intention gives these things back and moreso: as their hypothesis, if 'the many' exists, causes laughter yet, rather than 'the One' to Be.' Zeno thus indirectly supports a Parmenidean thesis by what appears to be a *reductio ad absurdum* methodology. Parmenides in Platonis Opera Vol. II, ed. J. Burnet (Oxford: Oxford University Press 1901), $128^{b}6$-$128^{d}6$.

dum examples in Parmenides, to the appearances of the argument in the fragments of Melissus and in the later Pre-Socratics.[2] This historical continuity of the *reductio ad absurdum* method (and of indirect reasoning in general) in ancient metaphysics guarantees the significance of the Eleatics as being among the earliest logicians, or thinkers concerned with the methodology of reasoning, prior to Aristotle.

This chapter will primarily investigate one example of Eleatic *reductio ad absurdum* reasoning from Parmenides of Elea, so as to gain an understanding of the philosophical use of the *reductio ad absurdum* method by the first major Eleatic thinker. The philosophical significance of this example is its use in demonstrating the metaphysical character of ἐὸν, or Being, of an object of knowledge. This significant philosophical use will be shown in section 2 through an explication of Parmenides' poem leading up to the *reductio ad absurdum* example itself. The logical framework and the validity of his example will then be examined in sections 3 and 4, so as to provide a deeper understanding of its logical aspects.

Section 2: The Poem of Parmenides

Parmenides' only extant poem begins with a narrator who is taken beyond the human sphere to an unnamed goddess. The narrator first learns from the goddess that οὔτι σε μοῖρα κακὴ προὔπεμπε νέεσθαι τήνδ' ὁδόν (ἦ γὰρ ἀπ' ἀνθρώπων ἐκτὸς πάτου ἐστίν), ἀλλὰ θέμις τε δίκη τε, 'no evil fate was sending you forth to come this way (for it is outside the well-trod way of human-kind) but

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[2] The *reductio ad absurdum* argument in Melissus is found in DK. 273, [B8]. Another Pre-Socratic thinker with a similar *reductio ad absurdum* argument to those of the Eleatics (Parmenides specifically) is Empedocles DK. 317-318, [B17, lines 30-35].

right and justice.'[3] Righteousness and Justice force the narrator's journey beyond the human sphere, explains the goddess, because beyond the human sphere lay the ability 'to learn everything,' (πάντα πυθέσθαι): both Ἀληθείης, 'truth,' and βροτῶν δόξας, 'the beliefs of mortals.'[4] The metaphysical character of what is to be learned is thus established by its divine source. Moreover, since this ὁδόν, or 'road,' is represented as the path that has led beyond the human sphere and into the divine sphere, and because traveling on the road is represented as 'righteous and just,' the metaphysical nature of this knowledge is also established by the righteousness and justice of traveling on this transcendent road. In this way, the metaphysical character of knowledge is established by what the goddess will teach to the narrator later in the poem. The importance of establishing this metaphysical character of knowledge in Parmenides' poem will also be seen next: in its use as a foundation for what can and what can not be known in the human sphere.

The poem then continues as the goddess elaborates the metaphysical character of her teachings by describing the foundation for establishing what can and what cannot be known in the human sphere. This foundation is based, says the goddess, upon one of three possibilities of knowledge. The first possibility is ἡ μὲν ὅπως ἔστιν τε καὶ ὡς οὐκ ἔστι μὴ εἶναι, 'either it verily is, and as it is not, Not-To-Be.'[5] The second possibility is ἡ δ' ὡς οὐκ ἔστιν τε καὶ ὡς χρεών ἐστι μὴ εἶναι, 'or as it is not, as it is necessary Not-To-Be.'[6] And the

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[3] DK. 230, [B1, 26-28].

[4] DK. 230, [B1, 29-30].

[5] DK. 231, [B2, 3].

[6] DK. 231, [B2, 4].

third possibility is παλίντροπός, a 'back-turning path,' which results from choosing the first and the second possibilities, Being and Not-Being.[7] The goddess explains that the first possibility is the way of Πειθοῦς, 'persuasion,' since "Αληθείηι γὰρ ὀπηδει', 'for it follows truth.' The second possibility, says the goddess, is to beπαναπευθέα ἔμμεν ἀταρπόν οὔτε γὰρ ἂν γνοίης τό γε μὴ ἐὸν (οὐ γὰρ ἀνυστόν) οὔτε φράσαις, the 'wholly unknown path/For you can neither know the Not-Being thing (for it is not practicable), nor indicate it.'[8] In this way, the foundation of what can and what cannot be known is based upon the ontology of an object of knowledge, or the Being and/or the Not-Being of an object of knowledge. It is the ontological foundation (provided by these three possibilities) that is represented in the poem as metaphysical in character, because it establishes from beyond the human sphere what can and what can not be known in the human sphere.

Parmenides then grounds the foundation for human knowledge in the existence, or Being, of an object of knowledge (*i.e.*, in the first possibility). For the goddess proclaims that the first possibility is the only possibility which follows from an understanding that Being 'verily is, and as it is not, Not-To- Be.' As a result, the first possibility becomes the only persuasive possibility for determining what constitutes human knowledge. The second possibility is ruled out as a possible foundation of human knowledge because in it, the Being of an object of knowledge does not exist, 'as it is necessary Not-To-Be.' Thus, there are no objects of knowledge in the second possibility, because such objects neither exist, nor are capable of being known as objects of knowledge; this possibility is, to be succinct, a 'wholly unknown path.' Only the possibility based upon the Being of an object of knowledge can persuade us of

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[7] DK. 233, [B6, 9], "πάντων δὲ παλίντροπός ἐστι κέλευθος."

[8] DK. 231, [B2, 6-9].

the truth in an object of knowledge. In this way, Parmenides provides an ontological foundation for human knowledge in the Being of an object of knowledge (*i.e.*, in the first possibility).

In addition to the ontological grounds, Parmenides also argues that the first possibility is the foundation for human knowledge on logical grounds, *viz.*, through the logical necessity of the first possibility. In the poem, the goddess continues her instruction by stating that χρὴ τὸ λέγειν τε νοεῖν τ' ἐὸν ἔμμεναι· ἔστι γὰρ εἶναι μηδὲν δ' οὐκ ἔστιν· τά σ' ἐγὼ φράζεσθαι ἄνωγα, 'it is necessary to say and to think Being, for Being exists, and nothing does not exist. These things I command you to declare.'[9] The logical necessity of the first possibility is thus reduced to the statement that 'Being exists, and nothing does not exist, therefore only Being by necessity is spoken and thought.' Earlier in the poem, this concept of logical necessity was suggested by the goddess when she referred to the first possibility as the way of 'persuasion, for it follows truth.' Here, the first possibility is implied to have logical necessity because it is the only possibility that can be assigned truth according to the Being of an object of knowledge. Hence, true and persuasive knowledge, says the goddess, is by necessity found only in the first possibility, because both speech and thought solely express what exists, *viz.*, Being. In this earlier context then, the first possibility is suggested to have a logical necessity over the second and third possibilities because it alone is in possession of the truth.

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9 DK., 232, [B6, 1-3]. This translation follows the interpretation suggested in Leonardo Taran's book Parmenides (Princeton: Princeton University Press, 1965), 58. It "consists in keeping τὸ λέγειν τε νοεῖν τ' as an articular infinitive, while taking ἔμμεναι to be the complementary infinitive with χρὴ; that leaves ἐὸν as the object of λέγειν and νοεῖν, i.e., χρὴ εἶναι τὸ λέγειν τε νοεῖν τ' ἐὸν." This interpretation is, as Taran points out, "the exact complement" to 'for you can neither know the Not-Being thing (for it is not practicable), nor indicate it,' in fragment B2, 7-9.

The logical necessity of the first possibility is further emphasized in the goddess' explanation of why the second possibility can not have logical necessity. For the goddess continues her remarks about the logical necessity of 'saying and thinking Being,' by stating, οὐ γὰρ μήποτε τοῦτο δαμῇι εἶναι μὴ ἐόντα," 'for this shall never be proved that Not-Being exists.'[10] The reason why the second possibility cannot have logical necessity is because it can not be proven to possess Being, *i.e.*, that 'Not-Being exists,' or, that Not-Being things (if such things could be spoken, thought, or indicated in some way) exist. Thus, the second possibility does not possess the persuasiveness of truth, which denies it any logical necessity in its objects (or, non-objects) of knowledge. In this way, because it can never be proven to possess Being, there can not be any truth assigned to the second possibility. Thus, the second possibility can not have logical necessity. It is therefore due to the ontological status of the first possibility that it is by logical necessity the foundation for human knowledge.

The overall logical nature of Parmenides' poem is also established in the following way, as Parmenides continues his remarks on the logical necessity of the first possibility:

ἀλλὰ σὺ τῆσδ' ἀφ' ὁδοῦ διζήσιος εἶργε νόημα
μηδέ σ' ἔθος πολύπειρον ὁδὸν κατὰ τήνδε βιάσθω,
νωμᾶν ἄσκοπον ὄμμα καὶ ἠχήεσσαν ἀκουήν
καὶ γλῶσσαν, κρῖναι δὲ λόγωι πολύδηριν ἔλεγχον
ἐξ ἐμέθεν ῥηθέντα.[11]

But bar your thought from this way of inquiry and never let overly confining habit force you according to this way; direct unregardful sight and roaring sound and tongue, and judge by reason the much-contested refutation which has been given by me.

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10 DK., 234, [B7, 1].

11 DK., 234-5, [B7, 2-6].

The way of inquiry from which the goddess warns to bar thought, and not be forced by habit into following, is the second possibility that 'as it is not, as it is necessary Not-To-Be.' This is evident by the context of the previous statement in this section of the poem, in which the goddess stated that it 'shall never be proved that Not- Being is to Be.' What is significant about the passage is that the goddess then asks one to direct one's sense perception (what one sees and hears) toward making a judgement of one's own with the aid of λόγωι, 'reason,' about this refutation of the second possibility. In this way, Parmenides is establishing the importance of logical reasoning in the verification of his refutation of the second possibility. Its significance can be seen both within, and extending in influence beyond Parmenides' poem. This request to 'judge by reason,' foreshadows the later examples of *reductio ad absurdum* reasoning in the poem, where the refutation of the second possibility is re-introduced (so as to effect the logical impossibility of a contradictory hypothesis). And this request to 'judge by reason,' presumably influenced (if it is not actually manifested in) the defenses of Parmenides' approach to knowledge and reality by Zeno of Elea, and by Melissus of Samos. In this way, the significance of Parmenides' poem in the history of logic is already established in an exhortation to 'judge by reason,' or to 'judge by logic,' the much-contested refutation that Not- Being is not the way to truth.

Parmenides' poem is thus concerned with an ontological foundation for human knowledge, which will give objects of human knowledge a way to establish the per- suasiveness of a metaphysical truth to an object of human knowledge. To further establish the ontological character of an object of knowledge, Parmenides establishes the logical necessity of this ontological foundation. For it is not only on ontological grounds, but also by logical necessity, that an object of knowledge 'verily is, and as it is not, Not-To-Be.' This, in sum, represents the general tenor of Parmenides' poem, leading up

to his examples of *reductio ad absurdum* reasoning in the poem.

Section 3: The Reductio Ad Absurdum Argument

The *reductio ad absurdum* argument in Parmenides' poem forms an integral part of his overall program in the poem.[12] The argument sets out to establish the metaphysical character of knowledge by setting out to demonstrate the metaphysical character of the Being of an object of knowledge. In this way, Parmenides is arguing that knowledge has a metaphysical character (which was first hinted in the metaphysical journey taken by the narrator), by maintaining that the Being of an object of knowledge possesses a demonstrable metaphysical attribute.[13] Parmenides' *reductio ad absurdum* arguments in the poem can be understood in the context of demonstrating this metaphysical character of knowledge.

This context first appears in Parmenides' poem (as preserved in Diels' Die Fragmente Der Vorsokratiker) as follows:

μόνος δ' ἔτι μῦθος ὁδοῖο
λείπεται ὡς ἔστιν· ταύτηι δ' ἐπὶ σήματ' ἔασι
πολλὰ μάλ', ὡς ἀγένητον ἐὸν καὶ ἀνώλεθρόν ἐστιν,
ἔστι γὰρ οὐλομελές τε καὶ ἀτρεμὲς ἠδ' ἀτέλεστον·
οὐδέ ποτ' ἦν οὐδ' ἔσται, ἐπεὶ νῦν ἔστιν ὁμοῦ πᾶν,
ἕν, συνεχές· τίνα γὰρ γένναν διζήσεαι αὐτοῦ;
πῆι πόθεν αὐξηθέν; οὐδ' ἐκ μὴ ἐόντος ἐάσσω

And yet the single spoken way is left, as it is. And on the basis of this, very many signs exist, as it is uncreated, one, and indestructible; whole, unique, and unshaken, and also without end. For it neither was, at some time, nor will it Be, since it

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12 Parmenides' example of *reductio ad absurdum* reasoning (to be examined in this section) is one of three in this section of the poem. *Cf.* Alexander P.D. Mourelatos The Route Of Parmenides (New Haven: Yale University Press, 1970) 98-103.

13 In fact there are seven metaphysical attributes of Being (but see note 14 below).

φάσθαι σ' οὐδὲ νοεῖν· οὐ γὰρ φατὸν οὐδὲ νοητόν ἔστιν ὅπως οὐκ ἔστι.[14]

is now together, all, one, continuous Being. For what birth will you seek for it; in what way hence had it been grown? I will neither permit you to say nor to think out of Not-Being. For it is neither spoken nor thought in the manner of it is not.

This context (for demonstrating the metaphysical character of Being) can be explained by recalling the previous passage in the poem concerning the refutation of the second possibility, *viz.*, after the second possibility is refuted, says Parmenides, only the first possibility that can express and think Being remains as a viable foundation for knowledge. It is this remaining way that possesses 'very many signs,' says Parmenides, which justifies the first possibility to be irrefutable, and true.[15] The importance of these signs can be

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[14] DK., 235-236, [B8, 1-10]. This translation does not adhere to Parmenides' poem in DK, but rather to one of its original sources: Simplicius *In Aristotelis Physicorum* [145.1-146.25]. The preference for Simplicius is due to a convincing textual emendation in line 4, where οὖλον ('whole') and μουνογενές ('unique') in Simplicius was substituted in DK by οὐλομελές ('whole of limb'); DK had derived οὐλομελές from unreliable sources (Plutarch, Proclus, and the PS-Plutarchian *Stromateis*) according to G.E.L. Owen in his essay, "Eleatic Questions," (in Studies In Presocratic Philosophy Vol.II, ed. by R.E. Allen and D.J. Furley (London: Routledge & Kegan Paul, 1975), 76-77. This emendation is followed by Taran, 88-91; Kirk, Raven, & Scholfield, 248; Mourelatos, 113, 131; and Barnes, 179-180. Note that with the acceptance of Simplicius/Owen, there is an acceptance of seven 'signs,' or metaphysical attributes of Being, whereas there are six in DK. An explanation on how Parmenides may be reconciling this plurality of attributes with his monistic ontology, is given in the next note (#15).

[15] The presence of 'signs' (in the sense that they represent a plurality of things) in Parmenides' monistic ontology at first seems inconsistent. How can Parmenides justify Being as a unity by referring to its 'very many signs'? One answer might be that the signs are not intended to have any ontological

viewed in at least two ways: first, the signs attribute the Being of an object of knowledge with metaphysical chararacteristics (thus attributing the object of knowledge itself with these characteristics); and second, the signs represent the conclusions in at least three *reductio ad absurdum* arguments which are present in this fragment (*viz.* B8) of the poem.[16]

The signs of ἀγένητον ('uncreatedness') and ἀνώλεθρόν ('indestructibility') are demonstrated in the first *reductio ad absurdum* argument. These signs are immediately identified as the original conclusion of Parmenides' argument because they are connected to a set of premisses in the next sentence (lines 5-6) of the fragment (B8): οὐδέ ποτ' ἦν οὐδ' ἔσται, ἐπεὶ νῦν ἔστιν ὁμοῦ πᾶν, ἕν, συνεχές, '(Being) neither was, at some time, nor it will Be, since it is now (a) together, all, one, and continuous Being.' The status of lines 5-6 as a set of premisses is primarily understood when the clauses in lines 5-6 are read in reverse order: ἐπεὶ νῦν ἔστιν ὁμοῦ πᾶν, ἕν, συνεχές, οὐδέ ποτ' ἦν οὐδ' ἔσται, 'since Being is now together, all, one, and continuous, Being neither was, at some time, nor it will Be.' The second clause becomes the first premiss due to the word ἐπεὶ, or 'since,' in the second clause (as follows) of line 5: οὐδέ ποτ' ἦν οὐδ'

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status, *i.e.*, they are metaphors in the same way that Being is described in a simile later in the poem: εὐκύκλου σφαίρης ἐναλίγκιον ὄγκωι, as 'resembling a well-rounded sphere in mass,' [B8,43] (the word ἐναλίγκιον, or 'resembling,' here has largely a poetic meaning, LSJ. 553). Since Parmenides begins his list of signs (ὡς ἀγένητον ἐὸν καὶ ἀνώλεθρόν ἐστιν...) in B8,3 with the word 'ὡς,' which has the meaning of 'as,' or 'like,' it may be that the signs are also poetical expressions of his concept of Being, and not intended to be real qualities of Being.

16 This chapter will only examine the argument demonstrating the ἀγένητον ('uncreatedness') and ἀνώλεθρόν ('indestructibility') of Being (DK., 235-236, [B8, 1-10]). The οὖλον, ('wholeness') and the μουνογενές, ('uniqueness,') of Being are demonstrated in lines 22-25; the ἀτρεμὲς, ('unshakenness') and the ἀτέλεστον, ('endlessness') of Being are demonstrated in lines 26-31 and 32-33 respectively.

ἔσται, {ἐπεὶ νῦν ἔστιν ὁμοῦ πᾶν, ἕν, συνεχές}, 'since it is now (a) together, all, one, and continuous Being.' The priority of the second clause over the first clause is also shown by the present indicative verb ἔστιν, or 'is' in the second clause, (ἐπεὶ νῦν ἔστιν ὁμοῦ πᾶν, ἕν, συνεχές) which suggests that Parmenides is drawing from a present state of facts for his first premiss. Hence, this second clause (ἐπεὶ νῦν ἔστιν ὁμοῦ πᾶν, ἕν, συνεχές) represents the first premiss in Parmenides' argument.[17] The first clause in line 5, meanwhile, represents an intermediate conclusion: 'Being neither was, at some time, nor it will Be.' This statement represents an inference about the temporal character of Being drawn from the attributes listed in the first premiss: *viz.*, since Being is presently together (ὁμοῦ), all (πᾶν), one (ἕν), and continuous (συνεχές), Being neither was, at some time, nor it will Be.' In other words, Parmenides is saying that the Being (or reality) of an object of knowledge cannot be reflected upon as a thing of the past, nor can it be anticipated in a future time. Because of its unbroken continuity and encompassing unity, Being has always been, is in fact now, and will always exist. Thus, Parmenides' premisses for his conclusion that Being is uncreated (ἀγένητον) and indestructible (ἀνώλεθρόν) are derived by reading the clauses in lines 5-6 in reverse order: ἐπεὶ νῦν ἔστιν ὁμοῦ πᾶν, ἕν, συνεχές, οὐδέ ποτ' ἦν οὐδ' ἔσται, 'since Being is now together, all, one, and

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17 The attributes listed in the second clause of line 5 are synonymous with some of the other metaphysical signs of Being: the οὖλον ('wholeness'), and the μουνογενές, ('uniqueness,') of Being in line 4 are equivalent to the πᾶν (all), ὁμοῦ (togetherness), and the ἕν (oneness) of it; and the ἀτέλεστον ('endlessness') in line 4 is equivalent to the συνεχές (continuity) in line 5. This suggests that if the signs are not to be taken as metaphors, then each metaphysical sign of Being would be demonstrated with the help of the other signs. This is damaging to Parmenides' argument, since each sign would then have all the other signs attributed to itself, and thus lend a degree of circularity and incoherence to Parmenides' argument. It may have been for this reason that Parmenides sought to justify his conclusion via the *reductio ad absurdum* route.

continuous, Being neither was, at some time, nor it will Be.'

In this way, an argument is formulated by Parmenides based upon the metaphysical characteristics of Being (*viz.*, the Being of an object of knowledge):

1a. Premiss:	Since Being is now together, all, one, and continuous (B8,5).
1b. Intermediate Conclusion:	Being neither was, at some time, nor it will Be (B8,5).
2. Original Conclusion:	Being is uncreated and indestructible (B8,3).

The importance of this argument in lines 3-5 is immediately seen in lines 6- 10 of this overall passage (underscored below), because Parmenides then designs a *reductio ad absurdum* argument to demonstrate the ἀγένητον ('uncreatedness') and the ἀνώλεθρόν ('indestructibility') of Being:

μόνος δ' ἔτι μῦθος ὁδοῖο
λείπεται ὡς ἔστιν· ταύτηι δ' ἐπὶ σήματ' ἔασι
πολλὰ μάλ', ὡς ἀγένητον ἐὸν καὶ ἀνώλεθρόν ἐστιν,
ἔστι γὰρ οὐλομελές τε καὶ ἀτρεμὲς ἠδ' ἀτέλεστον·
οὐδέ ποτ' ἦν οὐδ' ἔσται, ἐπεὶ νῦν ἔστιν ὁμοῦ πᾶν,
ἕν, συνεχές· <u>τίνα γὰρ γένναν διζήσεαι αὐτοῦ;
πῆι πόθεν αὐξηθέν;</u>[18]

And yet the single spoken way is left, as it is. And on the basis of this, very many signs exist, as it is uncreated one, and indestructible; whole, unique, and unshaken, and also without end.For it neither was at some time, nor will it Be, since now it is together, all, one, continuous Being. <u>For what birth will you seek for it; in what way hence had it been grown</u>?

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[18] <u>DK</u>., 235 [B8, 6-7].

With these seemingly rhetorical questions (for what birth will you seek for it; in what way hence had it been grown?), Parmenides initiates a *reductio ad absurdum* framework in support of the conclusion that ' Being is uncreated and indestructible.' For these questions represent (3) the hypothesis which contradicts (2) the original conclusion, according to the paradigm *reductio ad absurdum* framework found in Aristotle.[19]

The hypothesis concerned with seeking the birth (γένναν) and the growth (αὔξηθέν) of Being assumes that Being underwent a process of creation culminating in its birth, and then after its birth, began a process of development, or growth. But Parmenides is not asking his audience whether such a birth or such a development ever existed. More importantly, Parmenides assumes that such a birth and development occurred at some time, and challenges his audiences to find a birth and a growth for Being. In this way, Parmenides is hypothetically denying his conclusion (that 'Being is uncreated and indestructible) by asking, in effect, 'for if Being is indeed created then in what way is this evident, and if Being is indeed destructible, then in what way also, is this evident? In other words, Parmenides is asking his audience to disprove his conclusion by revealing any evidence that would contradict him. It is in this way that the questions posed in lines 6-7 of this section of the poem, ' for what birth will you seek for it; in what way hence had it been grown,' can be identified as (3) the hypothesis that is contradictory to Parmenides' original conclu-

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[19] Once again, the framework from Aristotle's *Prior Analytics* 29a37-39 (used in the previous chapter) will be used as the paradigm: (1) premiss; (2) original conclusion; (3) an hypothesis that is contradictory to the original conclusion; (4) a conclusion drawn from this hypothesis; and (5) part of the original premiss, which is re-introduced and contradicts the conclusion drawn from (3) the contradictory hypothesis, which demonstrates the original conclusion by *reductio ad absurdum* of its denial.

sion.[20]

Thus, Parmenides' *reductio ad absurdum* argument begins in this way:

1a. Premiss:	Since Being is now together, all, one, and continuous (B8,5).
1b. Intermediate Conclusion:	Being neither was, at some time, nor it will Be (B8,5).
2. Original Conclusion:	Being is uncreated and indestructible (B8,3).
3. The hypothesis that is contradictory to the original conclusion:	For what birth will you seek for it; in what way hence had it been grown? (B8,6-7)

In (3) the contradictory hypothesis, it appears that only the uncreatedness of Being from (2) the original conclusion is addressed (by the contradictory hypothesis of Being's 'birth'). The indestructibility of Being in (2) the original conclusion appears not to be represented by an hypothesized contradiction, since 'growth' (αὔξηθέν) clearly does not imply by contradiction that (2) Being is indestructible (ἀνωλεθρόν); its contradiction would imply that Being simply does not grow. The designation of growth (αὔξηθέν) as the contradiction of indestructible (ἀνωλεθρόν) can be understood in two ways: first, in the same way

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[20] It may be argued that through this *reductio ad absurdum* hypothesis of Being's birth and growth, that Parmenides is intending to deny that Being is capable of possessing any biological (or specifically human) attributes (such as birth and growth). This interpretation would tie his *reductio ad absurdum* argument closer to Xenophanes (who also uses the biological attribute of 'birth' in a *reductio ad absurdum* argument concerning the attributes of a metaphysical Being, *i.e.*, 'one god').

as the designation of birth (γένναν) represents the contradiction of uncreatedness (ἀγένητον), *viz.*, through the metaphysical attributes listed in and meant by premiss 1a; and second, as a contradiction between the permanence (or non-alteration) of Being, and the impermanence (or alteration) of Being. In the first way, Being is uncreated and indestructible in the sense that Being νῦν ἔστιν ὁμοῦ πᾶν, ἕν, συνεχές, 'is now together, all, one, and continuous Being.' Because it is 'together,' 'all,' and 'one,' Being is singularly all-inclusive of everything that exists; *i.e.*, Being is not the sum of its parts, but a singular pervasiveness which can neither have more Being added to it, nor have Being subtracted from it. Thus, for Parmenides, Being is indestructible because it cannot undergo an expansion or a diminuition of its nature (because Being is 'together,' 'all,' and 'one'). Thus, in the same way that it is a contradiction for a continuous (συνεχές) Being to have originated from a birth (γένναν), or any type of ingression *into Being* (for such a motion would contradict its continuous nature), by appealing to the metaphysical attributes of Being, the contradiction of 'indestructibility' can be construed as 'growth' (since 'growth' would imply the addition of more Being to Being. In the second way, growth implies the contradiction of indestructible because Parmenides ultimately denies that Being can alter itself in any way, whether by growth or by destruction. It is later in the fragment that Parmenides denies that Being can change: αὐτὰρ ἀκίνητον μεγάλων ἐν πείρασι δεσμῶν ἔστιν ἄναρχον ἀπαυστον, ἐπεὶ γένεσις καὶ ὄλεθρος τῆλε μάλ' ἐπλάχθησαν, 'since creation and destruction have been banished, Being is independent, neverending, (and) changeless, but in confining fetters.'[21] In other words, Being is in a state of 'fettered' permanence, such that it cannot undergo any type of alteration. To express the permanence of Being, Parmenides uses the word ἀνωλεθρόν, or

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[21] DK., 237, [B8, 26- 27].

'indestructible' (and conversely, Parmenides expresses the hypothesized impermanence of Being by using the word αὔξηθέν 'growth'). Thus, on an implicit level, 'growth' contradicts 'indestructibility' when it is construed that 'indestructibility' is equivalent to the unchanging permanence of Being (or its non-alteration), and 'growth' is construed to mean the hypothesized impermanence (or the alteration) of Being. That is to say, 'growth' contradicts 'indestructibility' because impermanence (or alteration) contradicts permanence (or non- alteration). Thus, through the metaphysical attributes of Being, and through the more explicit contradiction of alteration and non-alteration later in the fragment, (3) the hypothesis of 'growth' is able to correspond as a contradiction to (2) the 'indestructibility' of Being in Parmenides' *reductio ad absurdum* argument.

In the next two lines of the poem, (4) an intermediate conclusion, which is drawn from the contradictory hypothesis, and which conflicts with (1a-b) the premisses of the original conclusion, can be identified (underscored below).

μόνος δ' ἔτι μῦθος ὁδοῖο
λείπεται ὡς ἔστιν· ταύτηι δ' ἐπὶ σήματ' ἔασι
πολλὰ μάλ', ὡς ἀγένητον ἐὸν καὶ ἀνώλεθρόν ἐστιν,
ἔστι γὰρ οὐλομελές τε καὶ ἀτρεμὲς ἠδ' ἀτέλεστον·
οὐδέ ποτ' ἦν οὐδ' ἔσται, ἐπεὶ νῦν ἔστιν ὁμοῦ πᾶν,
ἕν, συνεχές· τίνα γὰρ γένναν διζήσεαι αὐτοῦ;
πῆι πόθεν αὐξηθέν; οὐδ' ἐκ μὴ ἐόντος ἐάσσω
φάσθαι σ' οὐδὲ νοεῖν.[22]

And yet the single spoken way is left, as it is. And on the basis of this, very many signs exist, as it is uncreated one, and indestructible; whole, unique, and unshaken, and also without end.For it neither was was, at some time, nor will it Be, since it is now together, all, one, continuous Being. For what birth will you seek for it; in what way hence had it been grown? I will neither permit you to say nor to think out of Not-Being.

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[22] DK., 235 [B8 7-8].

This line seems meant as a reminder about the impossibility of choosing the second way for determining the objects of knowledge (that the second way is the 'wholly unknown path,' where 'you could neither know the Not-Being thing (for it is not practicable) nor indicate it'). In this latest passage, the goddess continues not to permit the choice of the second possibility; but significantly, it is in the context of the argument that Being is uncreated and indestructible. For what results is the absurdity of attributing birth and growth to Being, which then implies the uncreatedness and the indestructibility of Being by *reductio ad absurdum.*

This passage ('I will neither permit you to say nor to think out of Not-Being'), represents (5) this intermediate conclusion in the Aristotelian *reductio ad absurdum* framework in ways which fall within the *reductio ad absurdum* argument context, and also within the entire poem's context. It has already been noted that Parmenides has exhorted his audience to χρὴ τὸ λέγειν τε νοεῖν τ' ἐὸν ἔμμεναι· ἔστι γὰρ εἶναι, μηδὲν δ' οὐκ ἔστιν, to 'say and to think Being. For Being is and nothing is not.'[23] And before this, Parmenides has also characterized the second way as τὴν δή τοι φράζω παναπευθέα ἔμμεν ἀταρπόν οὔτε γὰρ ἂν γνοίης τό γε μὴ ἐὸν (οὐ γὰρ ἀνυστόν) οὔτε φράσαις, as a 'wholly unknown path/For you can neither know the Not-Being thing (for it is not practicable), nor indicate it.'[24] In short, Parmenides has already prohibited his audience from 'speaking,' 'thinking,' and 'indicating' the possibility of 'Not-Being' prior to the context of the *reductio ad absurdum* argument. Within the context of the argument, (which is to say, in the context of the contradictory hypothesis), Parmenides seems to be making the following unstated conclusion: that 'there is a birth and a growth of Being capable of being

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[23] DK., 232 [B6 1-2].

[24] DK., 231 [B2 6-9].

researched (or 'sought,' or even 'spoken,' 'thought,' or 'indicated'). This unstated conclusion would follow from (3) the contradictory hypothesis of seeking the 'birth' and the 'growth' of Being. But also within the *reductio ad absurdum* argument, Parmenides states that Being νῦν ἔστιν ὁμοῦ πᾶν, ἕν, συνεχές, 'is now together, all, one, continuous Being.'[25] Clearly, the metaphysical attributes of Being listed in the premisses of the argument prohibit the attributes of birth and growth for Being. In this way, it is due to the provisions within the context of the argument, and within the context of the entire poem, that Being cannot possess the attributes of birth and growth. And thus, (4) the intermediate conclusion drawn from (3) the contradictory hypothesis, is found in this passage (that, 'I will neither permit you to say nor to think out of Not-Being') of the poem.

Finally, (5) the part of the original premiss, which is re-introduced and contradicts the conclusion drawn from (3) the contradictory hypothesis, which demonstrates the original conclusion by *reductio ad absurdum* is found in the last line of his *reductio ad absurdum* argument:

μόνος δ' ἔτι μῦθος ὁδοῖο
λείπεται ὡς ἔστιν· ταύτηι δ' ἐπὶ σήματ' ἔασι
πολλὰ μάλ', ὡς ἀγένητον ἐὸν καὶ ἀνώλεθρόν ἐστιν,
ἐστι γὰρ οὐλομελές τε καὶ ἀτρεμὲς ἠδ' ἀτέλεστον·
οὐδέ ποτ' ἦν οὐδ' ἔσται, ἐπεὶ νῦν ἔστιν ὁμοῦ πᾶν,
ἕν, συνεχές· τίνα γὰρ γένναν διζήσεαι αὐτοῦ;
πῆι πόθεν αὐξηθέν; οὐδ' ἐκ μὴ ἐόντος ἐάσσω
φάσθαι σ' οὐδὲ νοεῖν· οὐ γὰρ φατὸν οὐδὲ νοητόν
ἔστιν ὅπως οὐκ ἔστι.[26]

And yet the single
spoken way is left, as it is.
And on the basis of this, very
many signs exist, as it is
uncreated, one, and indes-
tructible; whole, unique, and
unshaken, and also without
end. For it neither was, at
some time, nor will it Be,
since it is now together, all,
one continuous Being. For

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[25] DK., 235 [B8 5-6].

[26] DK., 236 [B8,9].

> what birth will you seek for it; in what way hence had it been grown? I will neither permit you to say nor to think out of Not-Being. For it is neither spoken nor thought in the manner of it is not.

Again, this part of the Aristotelian framework in Parmenides' poem appears to be a recapitulation of the necessity to choose the first possibility for determining the objects of knowledge. But it is within the context of demonstrating Being to be 'uncreated' and 'indestructible' that Parmenides importantly re-applies the refutation of the second possibility, so as to indicate the absurdity of denying the original conclusion. To assume, as he does, that Being admits 'birth' and'growth,' is to attribute Being with a past time and a future time; in other words, to attribute the Being of an object of knowledge with a temporal character. But to attribute Being with temporal characteristics is to imply that Being was, at one time, Not-Being. In this way, Being is attributed with both 'Being,' and also 'Not-Being.' This is a contradiction which proves the original conclusion by *reductio ad absurdum.* For to admit that Being had once been a 'Not-Being thing,' is, for Parmenides, to create a contradiction with the original premisses of his argument: that 'Being is, and nothing is not' (B2,3); that it is necessary to say and to think Being' (B6,1); and that Being is 'together, all, one, and continuous' (B8,5-6). In this way, this final passage represents (5) the re-introduction of part of the original premiss, which contradicts the conclusion drawn from (3) the contradictory hypothesis, and demonstrates the original conclusion by *reductio ad absurdum* .

With this latest passage, this example of a *reductio ad absurdum* argument in Parmenides can be interpreted from the poem as follows:

1a. Premiss:	Since Being is now together, all, one, and continuous (B8,5).
1b. Intermediate Conclusion:	Being neither was, at some time, nor it will Be (B8,5).
2. Original Conclusion:	Being is uncreated and indestructible (B8,3).
3. The hypothesis that is contradictory to the original conclusion:	For what birth will you seek for it; in what way hence had it been grown? (B8,6-7).
4. A conclusion drawn from the contradictory hypothesis:	I will neither permit you to say nor to think out of Not-Being (B8,7-8). This represents a conclusion drawn from (3) because it follows from an unstated conclusion of (3), that 'it is possible to say and to think of Being as Not-Being' (since 'birth' and 'growth' imply the non-existence of Being at some previous time). Parmenides is thus concluding from the hypothesis that Being is born and grows, that it is not permissible to say and to think of Being as Not-Being.'
5. Part of the original premiss which is re-introduced and contradicts the conclusion drawn from (3) the contradictory hypothesis, which demonstrates the original conclusion by *reductio ad absurdum.*	For it is neither spoken nor thought in the manner of it is not (B8,9) (This is a reiteration of (B2,3), (B6,1), and (B8,5-6) , which maintained that Not-Being cannot be an object of speech nor of thought. These premisses contradict the unstated conclusion implicit in (4) that 'it is possible to say and to think of Being as Not-Being.' Be-

> cause this unstated conclusion is inconsistent with these earlier premisses, the original conclusion that 'Being is both uncreated and indestructible,' is demonstrated by *Reductio Ad Absurdum*.

Section 4: The Validity of Parmenides' Argument

Parmenides completes his *reductio ad absurdum* argument by signifying the impossibility of birth and growth of Being on logical grounds. To assess the logical strength, or validity, of these grounds, a coherent logical relationship between the premisses and the conclusion of Parmenides' argument must be shown.[27] One way of showing this relationship is to translate the argument into a formal language, and then to draw inferences from the premisses to the conclusion according to a system of logical rules, or rules of inferences.[28] This section will attempt to do this by translating the premisses and conclusions of his argument according to the theory of quantification.[29]

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[27] The word 'validity' is derived from the Latin word, *validus*, which means "physically powerful, robust, strong, sturdy, or similar." Oxford Latin Dictionary, ed. P. G.W. Glare (Oxford: Oxford University Press 1968-1982), 2008. This sense of validity is observed in the modern conception of validity (as an argument form "that has no substitution instance with true premisses and false conclusion." Irving Copi, Symbolic Logic, 21) in which an argument with no instance where the premiss is true and the conclusion false displays 'logical strength.'

[28] A similar system is used by Barnes, who translates Parmenides' example into symbolic logic, and then demonstrates a chain of inferences leading to an absurdity, where the original conclusion is proved. The Presocratic Philosophers, 185-187.

[29] Quantification theory will be used to translate and determine the validity

Although his demonstration succeeds by means of an absurd conclusion, it is clear that Parmenides ultimately demonstrates his conclusion from the ontological status and metaphysical character of the first possibility. In order to properly assess the validity of Parmenides' conclusion, some premisses not mentioned in the above interpretation must be used in this assessment. In short, the assessment needs to include premisses of the first possibility overall, in addition to those premisses specific to the *reductio ad absurdum* example. In this way, the validity of the conclusion that Being is uncreated and indestructible is ultimately shown to rest on the overall premisses of the first possibility (which include those specific to the example).

The first of these premisses states, χρὴ τὸ λέγειν τε νοεῖν τ' ἐὸν ἔμμεναι, 'it is necessary to say and to think Being.' The symbolization of this statement into the notation of quantification theory appears in this way: (∀x) [Bx & (Lx & Nx)]. It means that 'for all things (∀x), x exists (Bx), and is both sayable and thinkable (Lx & Nx).[30] In this way, fragment B6, line 1, stands as an important, first premiss in the assessment of Parmenides' *reductio ad absurdum* argument.

The next premiss in Parmenides' argument is in fragment B6, lines 8-9: οἷς τὸ πέλειν τε καὶ οὐκ εἶναι ταὐτὸν νενόμισται κοὐ ταὐτὸν, πάντων δὲ παλίντροπός

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of Parmenides' argument because the *reductio ad absurdum* argument represents an attempt to quantify the metaphysical characteristics of Being, or to apply a number of appropriate constants, such as 'uncreated,' and 'indestructible,'*etc* ., to Being. It is noted that this interpretation of Parmenides' argument is also applicable to the *reductio ad absurdum* argument of Xenophanes (in the way that Xenophanes also attempts to describe a divine Being with appropriate characteristics).

[30] The ability to say and to think Being are symbolized separately from the existentiality of Being because they represent two new modes of Being, *i.e..*, not only does Being exist, but Being is both spoken and thought.

ἐστι κέλευθος, 'those for whom Being and Not-Being are to be deemed the same and not the same, here a back-turning path exists.' This premiss expresses the poem's third possibility for what can and cannot be an object of knowledge, *viz.*, that an object of knowledge can both exist and not exist. Since the third possibility represents the paradoxical association of the first and the second possibilities; it allows an object of knowledge to have both existence and non-existence. But because it represents what Parmenides would consider to be an untenable criterion of knowledge (insofar as it includes the non-existence of an object of knowledge), the third possibility strengthens the validity of the first possibility to be the sole criterion of knowledge. Moreover, the third possibility is seen as the παλίντροπός ἐστι κέλευθος, the 'back-turning way.' This is Parmenides' forecast of the third possibility's potential as a criterion for knowledge. That is to say, the third possibility leads to "ἄκριτα," or 'indecision,' about an object of knowledge.[31] Thus, the third, or 'back-turning way,' is an undecidable, and ultimately unpragmatic way for determining what can and can not be an object of knowledge. In this way, the third possibility is important for assessing the validity of Parmenides' argument; it represents a premiss which eliminates the possibility that an object of knowledge does not exist, and that an object of knowledge both exists and does not exist. The denial of the third possibility thus represents another general premiss in this assessment. The symbolization of this premiss appears in this way: (∀x) -(Bx & -Bx). It means that 'for all things (∀x), it is not the case that x exists and x does not exist.'

A third and final premiss for this assessment is from B8, lines 5-6, that Being νῦν ἔστιν ὁμοῦ πᾶν, ἕν, συνεχές, '(Being) is now together, all, one, and continuous.'[32] The formulization of this premiss into the notation of quan-

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[31] DK., 232, [B6,6-7] .

tification theory appears in this way: $(\forall x)$ [Bx $\supset$ (Ox & Px & Ex & Sx)] . It formally reads, 'for all things $(\forall x)$, if x exists (Bx), then x is together (ὁμοῦ, hence Ox), all (πᾶν, hence Px), one (ἕν, hence Ex), and con- tinuous (συνεχές, hence Sx). In short, it means that an object of knowledge possesses these attributes (Ox & Px & Ex & Sx) in so far as the object is assumed to exist.

But by assuming that the object exists, several other attributes of Being from B8 (lines 3-4) are implied by $(\forall x)$ [Bx $\supset$ (Ox & Px & Ex & Sx)] : ἀγένητον (uncreated), ἐὸν (one), ἀνώλεθρόν (indestructible), οὖλον (whole), μουνογενές (unique), ἀτρεμὲς (unshaken), and ἀτέλεστον (endless). For Parmenides began fragment B8 with the thesis that Being exists: μόνος δ' ἔτι μῦθος ὁδοῖο λείπεται ὡς ἔστιν, 'and yet the single spoken way is left, as it is.' In other words, to assume the first possibility (that Being exists) is to imply that all of the metaphysical attributes of Being also exist in an object of knowledge. In this way, the conclusion of Parmenides' *reductio ad absurdum* example can be formulated from (the assumption that Being exists) either in B8 lines 3-4 (Being is uncreated, one,; indestructible, whole, unique, unshaken, and endless), or in B8 lines 5-6 (Being is now together, all, one, and continuous). This assessment of the validity of Parmenides' argument will choose B8 lines 5-6 to express Parmenides' conclusion, *viz.*, $(\forall x)$ [Bx $\supset$ (Ox & Px & Ex & Sx)], because only lines 5-6 addresses the conclusion of Parmenides' *reductio ad absurdum* example (that Being is uncreated and is indestructible). In short, if it is demonstrated (on the basis of Being's existence) that Being is all, together, one, and continuous, then it follows by implication that Being is

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[32] This premiss corresponds to the first premiss in the interpretation of the argument (in the previous section,*vide* Premiss 1a, page 58).

also uncreated and indestructible.[33]

The premisses to be used in this assessment can be listed in their symbolized form as follows:

1. (∀x) [Bx & (Lx & Nx)]	For all things (∀x), x exists (Bx), and x is both sayable and thinkable (Lx & Nx). From χρὴ τὸ λέγειν τε νοεῖν τ' ἐὸν ἔμμεναι, 'it is necessary to say and to think Being.' (B6,1).
2. (∀x) -(Bx & -Bx)	For all things (∀x), it is not the case that x exists (Bx) and x does not exist (-Bx). From οἷς τὸ πέλειν τε καὶ οὐκ εἶναι ταὐτὸν νενόμισται κοὐ ταὐτὸν, πάντων δὲ παλίντροπός ἐστι κέλευθος, 'those for whom Being and Not-Being are to be deemed the same and not the same, here a back-turning path exists.' (B6,8-9).
3. (∀x) [Bx ⊃ (Ox & Px & Ex & Sx)]	For all things (∀x), if x exists (Bx), then x is together (Ox), all (Px), one (Ex), and continuous (Sx). From ἐπεὶ νῦν ἔστιν ὁμοῦ πᾶν, ἕν, συνεχές, '(Being) is now together, all, one, and continuous.' (B8, 5-6).
∴ (∀x) (Ox & Px & Ex & Sx)	Therefore, for all things (∀x), x is all (Ox),together (Px), one (Ex), and continuous (Sx). By implication, Being is uncreated and indestructible.

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[33] Note that this implication is an abridged version of the argument from section 3: (Premiss) since Being is now together, all, one, and continuous

The validity, or logical strength, of these premisses to infer the conclusion (that Being is uncreated and indestructible) can now be assessed. The validity of Parmenides' argument will be determined by a set of logical rules, or rules of inference. These rules of inference will deduce a series of intermediate conclusions that will lead to an absurd conclusion, and ultimately, to the final conclusion. These rules of inference, in other words, represent the connection between the premisses and the conclusion. They signify that there is a relationship based upon laws of logic between the premisses and the conclusion. In this way, the validity, or logical strength, of Parmenides' argument is to be shown by the correct application of a rule of inference upon a premiss or intermediate conclusion. It should be noted that steps 4-13 do not explicitly represent passages from Parmenides' poem; they instead represent implicit conclusions drawn from the poem.

1. $(\forall x)\,[(Bx)\ \&\ (Lx\ \&\ Nx)]$	Premiss
2. $(\forall x)\ -(Bx\ \&\ -Bx)$.	Premiss
3. $(\forall x)\ [(Bx)\ \supset\ (Ox\ \&\ Px\ \&\ Ex\ \&\ Sx)]$	Premiss
$\therefore\ (\forall x)\ (Ox\ \&\ Px\ \&\ Ex\ \&\ Sx)$	Conclusion.
4. $-(\forall x)\ (Ox\ \&\ Px\ \&\ Ex\ \&\ Sx)$	Contradictory Hypothesis. For no things $-(\forall x)$, it is the case that x is together, all, one, and continuous. From τίνα γὰρ

(B8,5); (Intermediate Conclusion) Being neither was, at some time, nor it will Be (B8,5); (Original Conclusion) Being is uncreated and indestructible (B8,3).

	γένναν διζήσεαι αὐτοῦ; πῆι πόθεν αὔξηθέν, 'For what birth will you seek for it; in way hence had it been grown? By hypothesizing that Being undergoes birth and growth, it is implied that Being would not be together, all, one, and continuous. (B8,6-7).
5. (∃x) -(Ox & Px & Ex & Sx)	From line 4, by Quantifier Negation. For some things (∃x), it is not the case that x is together, all, one, and continuous.
6. -(Oy & Py & Ey & Sy)	From line 5, by Existential Instantiation. For an instance of y, it is not the case that y is together, all, one, and continuous.
7. By & (Ly & Ny)	From line 1, by Universal Instantiation. For an instance of y, y exists (By), and y is both sayable and thinkable (Ly & Ny).
8. By ⊃ (Oy & Py & Ey & Sy)	From line 3, by Universal Instantiation. For an instance of y, if y exists, then y is together, all, one, and continuous.
9. -By	From Lines 6, 8 by *Modus Tollendo Tollens*. For an

instance of y, y does not exist.

10. By — From line 7 by Simplification. For an instance of y, y exists.

11. By & -By — From Lines 9,10 by Conjunction. For an instance of y, y exists and y does not exist.

12. (∃x) (Bx & -Bx) — From line 11 by Existential Generalization. For some things (∃x), it is the case that x exists and x does not exist.

13. (∃x) (Bx & -Bx) & (∀x) -(Bx & -Bx) — From lines 2,12 by Conjunction. For some things (∃x), it is the case that x exists and x does not exist, and, for all things (∀x), it is not the case that x exists and x does not exist. This inference represents an absurd state of affairs. It expresses a contradiction between the premisses of the argument and the inferences drawn from a hypothetical denial of the original conclusion (specifically between Premiss #2, which denies that x both exists and does not exist, and inference #11, which says that there are some things which both exist and do not exist.

14. (∃x) (Bx & -Bx) & -(∃x) (Bx & -Bx)	From line 13 by Quantifier Negation. For some things (∃x), it is the case that x exists and x does not exist, and, for not some of the things -(∃x), it is the case that x exists and x does not exist. This is a more explicit formulation of the contradiction in step #14.
15. -(∃x) -(Ox & Px & Ex & Sx)	From lines 4-14 by *Reductio Ad Absurdum*. For not some of the things (∃x), it is not the case that x is together, all, one, and continuous.
16. (∀x) (Ox & Px & Ex & Sx)	From line 15 by Quantifier Negation. Therefore, for all things (∀x), x is all (Ox), together (Px), one (Ex), and continuous (Sx). By implication, Being is uncreated and indestructible.

In this way, the validity of Parmenides' *reductio ad absurdum* is established. Starting from premisses derived from the poem itself (lines 1-3 of this assessment), the absurdity of the contradictory assumption (in line 4) is shown by the inferences in line 13 and 14: line 13 stated, (∃x) (Bx & -Bx) & (∀x) -(Bx & -Bx), 'for some things (∃x), it is the case that x exists and x does not exist, and, for all things (∀x), it is not the case that x exists and x does not

exist'; and line 14 stated, (∃x) (Bx & -Bx) & -(∃x) (Bx & -Bx), 'for some things (∃x), it is the case that x exists and x does not exist, and, for not some of the things -(∃x), it is the case that x exists and x does not exist.' This absurd conclusion, and each premiss leading to it, has been derived by a set of rules of inference (*Modus Tollendo Tollens* , Simplification, Conjunction, and some rules of inference governing the theory of quantification, *i.e* . , Universal Instantiation, Existential Instantiation, Existential Generalization, and Universal Generalization).[34] These rules provide the grounds for establishing a coherent, logical relationship between Parmenides' premisses and his conclusion. In this way, Parmenides' *reductio ad absurdum* argument displays logical strength, or validity.

Finally, how does this assessment of the validity of the argument fit into the rest of the passage (that is, into B8,7-8)? After Parmenides asks his listeners to find a birth and a growth for Being, he then states that οὐδ' ἐκ μὴ ἐόντος ἐάσσω φάσθαι σ' οὐδὲ νοεῖν · οὐ γὰρ φατὸν οὐδὲ νοητόν ἔστιν ὅπως οὐκ ἔστι, 'I will neither permit you to say nor to think out of Not-Being. For it is neither spoken nor thought in the manner of it is not.' Here, Parmenides is continuing to admonish his listeners not to say or to think out of Not-Being, because it would result in the absurdity of being able to say and think both what is, and what is not. Thus, the rest of the passage acts as a recapitulation of the absur-

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[34] *Modus Tollendo Tollens* seems to closely resemble the method of *reductio ad absurdum* reasoning. The desired effect in both seems to be a negation of a consequence: in *modus tollendo tollens* , through the form P ⊃ Q , -Q , therefore -P, and in *reductio ad absurdum* arguments, through the form P ⊃ (Q & -Q), therefore -P. Historically, *modus tollendo tollens* is not distinguishable from *reductio ad absurdum* until Abelard developed it (presumably from Stoic sources) in the early 1100's A.D. *C. f* ., Kneale & Kneale, The Development Of Logic, 219.

dity drawn in line 12. It is in this way that the above formulization fits into the rest of Parmenides' *reductio ad absurdum* argument.

This chapter set out to describe the philosophical significance of one *reductio ad absurdum* argument ascribed to Parmenides of Elea. The significance of Parmenides' example is primarily due to its philosophical use,*viz.*, as a means of demonstrating that the Being of an object of knowledge is metaphysical. The argument supports the metaphysical status of an object of knowledge by demonstrating that Being possesses certain metaphysical attributes, such as 'uncreatedness,' 'indestructibility,' *etc* . It should finally be noted that Parmenides' example of *reductio ad absurdum* reasoning does not in the least conjure what Aristotle meant by all prior logic (as being 'incomplete,' or 'unfinished'). Because of its disciplined exhibition of logic, its concern for concepts such as logical necessity, and its exhortation for others to 'judge by reason,' Parmenides' example of *reductio ad absurdum* reasoning is significant both in the history of logic prior to Aristotle, and in the study and history of metaphysics.

CONCLUSION

In conclusion, this thesis has demonstrated that there was a significant presence of logic before the Topics and the Sophistical Refutations. The presence of *reductio ad absurdum* reasoning dating well before the appearance of the Topics and the Sophistical Refutations indicates, contrary to Aristotle's statement in the Sophistical Refutations that οὐ τὸ μὲν ἦν, 'there was not one' prior study of logic, that there indeed was a prior study of logic. The presence of *reductio ad absurdum* reasoning prior to Aristotle also indicates, contrary to the standard translations of the first important passage from the Sophistical Refutations, that *it was not the case* that 'nothing existed at all' in the way of a study, or πραγματεία, on logic, or reasoning (συλλογίζεσθαι). Those translations which said that 'nothing existed at all' mislead the reader about the history of logic prior to Aristotle: they imply that the phrase, ἀλλ' οὐδεν παντελῶς ὑπῆρχεν, translated as 'nothing existed at all' (Pickard-Cambridge) and as 'nay, it did not exist at all' (Forster), is to be understood to imply that Aristotle began his investigations on logic *from nothing* .

The standard histories of logic which have used this passage to justify the originality of Aristotle's contribution to logic, are doubly misleading in this way: as they go on to ignore for the most part the importance of any earlier contributions to the study of logic prior to Aristotle in their accounts. The examples of *reductio ad absurdum* reasoning in this thesis imply that there did exist important prior studies, or πραγματεία, on logic that are far more sophisticated, significant, and interesting, than these standard histories of logic have apparently judged them to be.

From a grammatical analysis of the Sophistical Refutations passage in

the introduction, it became clear that Aristotle was indirectly referring to the studies on logic dating prior to the Topics and the Sophistical Refutations. His indirect acknowledgement of these prior studies on logic, in spite of his judging them as 'incomplete beginnings,' 'inadequate attempts,' or 'false starts,' significantly touches upon the importance of these studies in relationship to Aristotle's own treatises on logic. Simply stated, these prior works represent the theoretical beginnings of Aristotle's works on logic. For it is false to say that Aristotle started his investigations on logic *from nothing,* since Aristotle appears to refer to them as 'incomplete beginnings,' 'inadequate attempts,' and 'false starts.' By referring to these prior logics in this way, Aristotle must also be acknowledging them as the 'incomplete beginnings,' *of his own system of logic* .[1] Furthermore, the absence of Aristotle's usual account of the prior views of his topic is so atypical that it builds a case of negligence with which Aristotle seems plausibly charged.[2]

It must be made clear in what sense these Pre-Socratic examples of *reductio ad absurdum* reasoning are understood to be a pre-Aristotelian study of logic. Aristotle himself understood them as 'unsuccessful attempts' to impart a logical methodology, for Aristotle implies that previous to his

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1 The Greek word ὑπῆρχεν in the passage from the Sophistical Refutations could mean 'exist' in an Aristotelian sense (*viz.*, as matter actualized in some specific form). If so, then these prior logics would have had no actual existence, but only a potential existence. The phrase ἀλλ' οὐδεν παντελῶς ὑπῆρχεν would then mean that something had 'potentially begun,' *i.e.* , an Aristotelian-like system of logic had not been realized, but the potential for one had certainly existed. In this way, Aristotle may be referring to these prior logics as being 'potentially Aristotelian.'

2 It is not out of the question that Aristotle acknowledged these precursors of his logical system in one of his lost works on logic (*cf.* Diogenes Laertius, Lives, Vol.I, V.22-28).

own enterprise in logic, there had been an 'inadequate attempt,' to impart a theoretical and systematic account of reasoning.[3] Yet without considering Aristotle's unfavorable judgement of these previous starts in logic, the examples of *reductio ad absurdum* reasoning mentioned and examined in this thesis must be viewed nonetheless as important efforts to impart a methodology of *reductio ad absurdum* reasoning. Both Xenophanes and Parmenides are shown to exemplify their theory of *reductio ad absurdum* reasoning to their audiences (*viz.*, as ἐπιπρέπει, or congruity (*vide* Appendix, p. 100). They are both shown working through their arguments according to their tacit theory of logical congruity, by adding and discarding attributes which do and which do not 'fit' their metaphysical notions of divinity and ontology. In doing so, they very conceivably transmitted the logical procedure of *reductio ad absurdum* reasoning (as ἐπιπρέπει, or congruity) to their audiences in a theoretical and systematic way. The impact of these logical teachings can be observed in the examples of Zeno of Elea, Melissus of Samos, and Empedocles of Acragas, among others. It is in this way that the *reductio ad absurdum* arguments of Xenophanes and Parmenides represent more than an unsuccessful attempt to impart a systematic methodology of

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[3] In the Sophistical Refutations, Aristotle specifies as an example of an 'unsuccessful attempt to impart a theoretical and systematic account of reasoning', the ἐπιστικοὺς λόγους μισθαρνούντων, the 'eristic (or disputation) instructors who work for hire,' (of whom Plato could also be meant): οὐ γὰρ τέχνην ἀλλὰ τὰ ἀπὸ τῆς τέχνης διδόντες παιδεύειν ὑπελάμβανον, 'for giving not the art but training an assumption from the art.' *Topica Et Sophistici Elenchi* 183^{b}36-184^{b}4. Aristotle adds that their teaching was διόπερ ταχεῖα μὲν ἄτεχνος, 'both rapid and unsystematic.'(184^{a}1). For Aristotle, a proper πραγματεία or study in logic would consist of a slow, systematic training on the art of reasoning, emphasizing the knowledge of the theory, or rules, of the art, rather than a knowledge of the assumptions from the art (*i.e.*, its conclusions, or 'effects').

reasoning; it represents both an important pre-Aristotelian tradition of logic, and a precursor to the Aristotelian method of logic.

The methodology employed by this thesis consisted of a philological and a philosophical approach to the fragments of Xenophanes and Parmenides. This two fold approach was necessary for determining the meaning and the validity of their *reductio ad absurdum* arguments. First, the philological aspect undertook to confirm their examples to be *reductio ad absurdum* arguments. This confirmation was made possible by comparing their logical frameworks to the logical framework in a typical Aristotelian *reductio ad absurdum* argument. In some cases, the grammar and the doxography (or ancient sources) of each fragment were considered, so as to identify a fragment, or a line in a fragment, to be part of a *reductio ad absurdum* framework. Second, the philosophical aspect of the methodology involved an assessment of the validity of Xenophanes' and Parmenides' arguments. The validity of their examples was measured according to the standards of validity appropriate to each argument, *viz.*, an Aristotelian conception of inductive validity was used to assess Xenophanes' inductive example, and quantification theory was used to assess Parmenides' example. On the whole, this philological and philosophical methodology was employed so as to reveal the strengths and the weaknesses of the *reductio ad absurdum* examples of Xenophanes and Parmenides. This methodology has overall revealed the strengths and weaknesses of this important pre-Aristotelian method of logic from appropriate textual and logical standpoints.

This methodology was especially necessary in the case of Xenophanes because of the problem posed by the presence of two versions of his *reductio ad absurdum* argument. In order to determine the best possible version of Xenophanes' argument, the grammar and the doxography of each fragment

in Diels/Kranz's and in Clement's versions had been a factor in determining the best possible version of the argument.

Assessing their validity also contributed to solving the dilemma of the two versions by revealing their logical strengths and weaknesses (in addition to serving as the philosophical approach to Xenophanes' example). This two fold methodology has thus resulted, through textual and logical means, in favoring Clement's sacred version to be the best example of Xenophanes' argument (over Diels/Kranz's satirical version).

The methodology employed by this thesis can also be applied to other Pre- Socratic examples of *reductio ad absurdum* reasoning. As this thesis has mentioned, there are many other examples of *reductio ad absurdum* reasoning in Ancient Greek Philosophy: Zeno of Elea, Melissus of Samos, Empedocles of Acragas, and 5th Century Pythagoreans. To this illustrious company of names, Democritus of Abdera and Anaxagoras of Clazomenae may also be added. Clearly, the presence of the argument in these Pre-Socratic philosophers implies that it played an important role in the history of logic prior to Aristotle. Moreover, the presence of *reductio ad absurdum* reasoning in the dialogues of Plato further broadens the argument's Pre-Socratic significance in the history of logic prior to Aristotle. It would be the job of the methodology used in this thesis to elaborate the meanings of these other examples, and to assess their validity. This would lead to a greater understanding of the presence of *reductio ad absurdum* reasoning prior to Aristotle, and of its significance to Aristotle's works on logic.[4]

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[4] The presence of *reductio ad absurdum* reasoning in Aristotle is also in need of elaboration and understanding. This is because Aristotle is strangely inconsistent in his use of *reductio ad absurdum* reasoning. On the one hand, he treats it as an inadequate and incomplete method of reasoning, as well as a fallacious example of reasoning (because it commits the 'fallacy of false,

cause'). But on the other hand Aristotle uses the *reductio ad absurdum* method in the Prior Analytics to convert some of the moods of the second and third figure syllogisms into the moods of the first figure. It suggests that Aristotle ignored, or took no notice of the claims he made in the earlier Sophistical Refutations, and provided a *fallacious* method for transforming imperfect syllogisms into perfect syllogisms. This strange outcome underscores the significance of the *reductio ad absurdum* argument upon the Aristo- telian treatises on logic. It suggests that Aristotle has either committed an error or an inconsistency in his system of logic.

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APPENDIX: THE PRINCIPLE OF Επιπρέπει, OR 'FITTINGNESS' IN THE REDUCTIO AD ABSURDUM ARGUMENTS OF XENOPHANES AND PARMENIDES

In addition to their conclusions about the attributes of God and Being, their confirmed *reductio ad absurdum* logical frameworks, and their strong or weak displays of validity, the *reductio ad absurdum* arguments of Xenophanes and Parmenides are also jointly significant in the history of logic. Their significance to logic is not only shown by a procedure of conceptual analysis displayed in their arguments, but also by an implicit principle of logic that this procedure seems to follow. The presence not only of this procedure, but also of this implicit principle of logic, signifies that the *reductio ad absurdum* arguments of Xenophanes and Parmenides tacitly signify an ancient theory of logical analysis, which anticipates other ancient theories of logical reasoning, such as Plato's theory and practice of division, and the methodology of syllogistic analysis in Aristotle.[1]

The tacit principle of logic in their arguments is founded upon the use of the verb ἐπιπρέπει in fragment B26 of Xenophanes: αἰεὶ δ' ἐν ταὐτῶι μίμνει κινούμενος οὐδέν οὐδὲ μετέρχεσθαί μιν ἐπιπρέπει ἄλλοτε ἄλλη, 'and he [God] always remains in this way, neither in motion/nor is it fitting for him to be moving around in another way.'[2] The verb ἐπιπρέπει means "it is fitting;" it also means "to be conspicuous, beseem, (or) suit."[3] This meaning of ἐπιπρέπει

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1 *Phaedrus* 265^{d}2-266^{b}; Prior Analytics 47^{a}1. There are many other principles, or rules, of reasoning, as well as versions of these principles, in Plato and Aristotle.

2 DK. 135, [B26].

3 LSJ., 653.

suggests the appearance of something so conspicuous of a subject that it is an appropriate, or congruous, appearance.[4] For example, *it is congruous* to ascribe a snub-nose to Socrates, since a snub-nose conspicuously appears in depictions of Socrates. Thus, it would be *incongruous* to depict Socrates without a snub-nose. In this way, the verb ἐπιπρέπει can signify a tacit theory of logical analysis,*viz.*, determining the logical truth of a statement according to the congruity, or symmetry, of the statement's subject and predicate.[5] A statement would be judged true or false insofar as the statement's predicate is found to be congruous (ἐπιπρέπει) or incongruous (οὐδὲ...ἐπιπρέπει) to the nature of its corresponding subject. In the case of Xenophanes B26, there is an incongruent correspondence between the subject and the attributes predicated by ἐπιπρέπει; it is 'not fitting' (οὐδὲ...ἐπιπρέπει) for God to be κινούμενος, 'moving,' nor μετέρχεσθαί, 'to be moving around.' In this way, Xenophanes uses the verb ἐπιπρέπει to indicate two attributes (κινούμενος and μετέρχεσθαί) that are not congruent (and hence, false) to the subject 'God.' Thus, the verb ἐπιπρέπει signifies a particular analytical relationship in fragment B26,*viz.*, the congruity, or symmetry, of a subject and predicate.

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4 The word is found in Homer, who uses ἐπιπρέπει to refer to the appearance befitting a slave: οὐδὲ τί τοι δουλειον ἐπιπρέπει εἰσοράασθαι εἶδος καὶ μέγεθος, (Odysseus is speaking to Dolius, an elderly slave) 'nor (your) form and stature fits when one is looking upon some slave.' Homer, Odyssey "Loeb Classical Library," Vol.II, trans. A.T. Murray, (London: William Heinemann, 1930), 24.252.

5 In the PS-Aristotelian text On Physionomonics (3rd Cent. A.D.), there is the ἐπὶ τὴν ἐπιπρέπειαν, the 'argument from congruity,' (810a34, 35, b9, 30, 811a5, b13, 19, 24, 813a1, 18, 814a7,*vide* 809a12-19). The 'argument from congruity' establishes the 'natural fittingness' of a subject's mental disposition with some physical feature of the subject, *e.g.*, (810a34) οἱ γυνίκροτοι κίναιδοι· ἀναφέρεται ἐπὶ τὴν ἐπιπρέπειαν, 'the effeminate types are knock-kneed, *by congruity* (of the disposition with the physical trait).' The Presocratic use of ἐπιπρέπει as an implicit principle of logic seems to foreshadow the use of ἐπὶ τὴν ἐπιπρέπειαν, the 'argument from congruity,' in the PS-Aristotelian text.

This meaning of ἐπιπρέπει from B26 appears to be a tacit rule of logic in the *reductio ad absurdum* arguments of Xenophanes and Parmenides, in spite of the fact that the verb ἐπιπρέπει does not appear in the original texts of these arguments. What appears as a sign of this theory in their examples is a procedure of conceptual analysis which follows this tacit principle of congruity. In short, it is this procedure of conceptual analysis which implies that the verb ἐπιπρέπει from B26 is a tacit principle of logic in their arguments. Thus, the basis for an ancient theory of logical analysis in the *reductio ad absurdum* arguments of Xenophanes and Parmenides rests in the explicit presence of this procedure.

Both versions of Xenophanes' *reductio ad absurdum* argument (*viz.*, Diels/Kranz and Clement) follow a procedure of conceptual analysis upon the possible attributes of God according to the logical congruity of these attributes to God. In the Diels/ Kranz version, fragment B11 stated, "πάντα θεοῖσ' ἀνέθηκαν Ὅμηρός θ' Ησιοδός τε, ὅσσα παρ' ἀνθρώποισιν ὀνείδεα καὶ ψόγος ἐστιν, κλέπτειν μοιχεύειν τε καὶ ἀλλήλους ἀπατεύειν," 'Homer and Hesiod have ascribed to the gods/With many reproachful human qualities and the flaw/Is theft, adultery, and fraud.' Clearly, the concept being analyzed is πάντα θεοῖσ', 'all the gods,' and κλέπτειν μοιχεύειν τε καὶ ἀλλήλους ἀπατεύειν, 'theft, adultery, and fraud,' are deemed incongruous to the definition of 'all the gods.' The incongruity of these attributes to 'the gods,' is established not solely because of the impropriety of these attributes, but because of the logical contradiction of doing so; *i.e.*, to ascribe any anthropomorphic attributes to the gods is to contradict the essential definition of 'all the gods.'[6] For Xenophanes, then,

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6 This interpretation (that Xenophanes is criticizing Homer and Hesiod for making an *analytical* error about the gods and their attributes) is also held by Jonathan Barnes. Barnes says that "(οὐδε...ἐπιπρέπει) 'it is not fitting' is Xenophanes' archaic and poetical version of 'it is not logically possible.' It does not 'fit' the essential nature of god, or our concept of what it is to be divine, to imagine that divinities locomote: that is to say, 'God moves' is self-contra-

there cannot possibly be 'gods' who commit such immoral acts as 'theft, adultery, and fraud.' Fragments B14 and B15 carry this conceptual analysis of the attributes of 'the gods' further. Xenophanes states in these fragments that 'the gods' must also be conceptually dissimilar to both human and other animal beings. Specifically, it is contradictory to the nature of 'the gods' to γεννᾶσθαι, to 'be born,' and τὴν σφετέρην δ' ἐσθῆτα ἔχειν φωνήν τε δέμας τε, and 'to have their own clothes, voice, and human form.' In this way, the Diels/ Kranz version of Xenophanes' *reductio ad absurdum* argument can be shown to follow a procedure of conceptual analysis on the possible attributes of the gods according to the congruity of these attributes to the gods.

The implicit principle of congruity, as shown by this conplementary procedure of conceptual analysis, is also apparent in Clement's version of Xenophanes' argument, that εἷς θεός, ἔν τε θεοῖσι καὶ ἀνθρώποισι μέγιστος, οὔτι δέμας θνητοῖσιν ὁμοίιος οὐδὲ νόημα, 'there is one God, the greatest among gods and mankind/Not like mortals in body or in mind.' In Clement's version, Xenophanes declares that a divine being's likeness to mortals 'in body and mind,' is incongruous with the definition of a divine being. It is clear that the mind and body of a divine being are not like the minds and bodies of other things, such as humans, and other animals.[7] In this way, the Diels/ Kranz and the Clement versions of the *reductio ad absurdum* argument of Xenophanes exemplify this implicit logical principle of ἐπιπρέπει, or congruity, through a conceptual analysis of the meaning of a divine being.

In Parmenides, the principle of congruity is also implicit, and is signified

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dictory." The Presocratic Philosophers, 85-86. In this way, the characteristics ascribed to πάντα θεοῖσ', 'all the gods,' or to εἷς θεός, 'one god,' in fragments B11, B14, B15, B23, and B26, are rejected by Xenophanes, interprets Barnes, upon the logical grounds that motion and mobility, birth, human voice, *etc.*, are attributes which are logically impossible for a divine being to have.

by its complementary procedure of conceptual analysis. Parmenides determines what is and what is not an attribute of Being according to the congruity of an attribute to the essential nature of Being. The list of Parmenidean attributes of Being (such as ἀγένητον, 'uncreatedness,' and ἀνώλεθρόν, 'indestructibility') are clearly the result of an analysis of the nature of Being; to paraphrase fragment 8, lines 1-5, because Being exists, Being possesses the attributes of uncreatedness, oneness, indestructibility, *etc*. In his *reductio ad absurdum* argument, a secondary list of Parmenidean attributes (wholeness, allness, oneness, and continuity) not only stems from an analysis of the nature of Being, but are used to show the incongruity of ascribing attributes in opposition to the list of congruous ones. Thus, the inadmissibility of ascribing γένναν, 'birth,' and αὐξηθέν, 'growth,' to Being is the result of determining that such attributes are incongruous to the nature of Being. Clearly, Parmenides is making an important distinction between the attributes that are congruous, and some attributes which are not congruous, to Being, due to an analysis of the nature of Being. In this way, the presence of the logical principle of congruity is implicitly shown by a procedure of analysis (of the nature of Being) in Parmenides.

A more complete study of this tacit logical principle of congruity is clearly necessary to understand its place in the history of logic. Nonetheless, the tacit presence of the meaning of ἐπιπρέπει from B26 in the *reductio ad absurdum* arguments of Xenophanes and Parmenides suggests that it represents a principle, of logical congruity, and may signify an ancient theory of logic, albeit an implicit one, in their overall thought.

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[7] Other fragments attributed to Xenophanes suggest more 'fitting' attributes of the mind and body of God. In fragments B24 and B25, God is [B24] : οὖλος ὁραῖ, οὖλος δὲ νοεῖ, οὖλος δέ τ' ἀκούει, 'wholeseeing, and he perceives all, and he hears all; and [B25] : ἀλλ' ἀπάνευθε πόνοιο νόου φρενὶ πάντα κραδαίνει. 'But without

toil he pulsates to the heart of every mind.' DK. 135 [B24, B25]. These fragments may have been a part of Clement's version of Xenophanes' *reductio ad absurdum* argument, which would mean that the attributes listed in them were also derived from Xenophanes' conceptual analysis of a divine being according to the principle of ἐπιπρέπει.